USDA NRCS Montana Snow Survey
WATER SUPPLY REPORT
Governor's Drought Advisory Committee
March 15th, 2012

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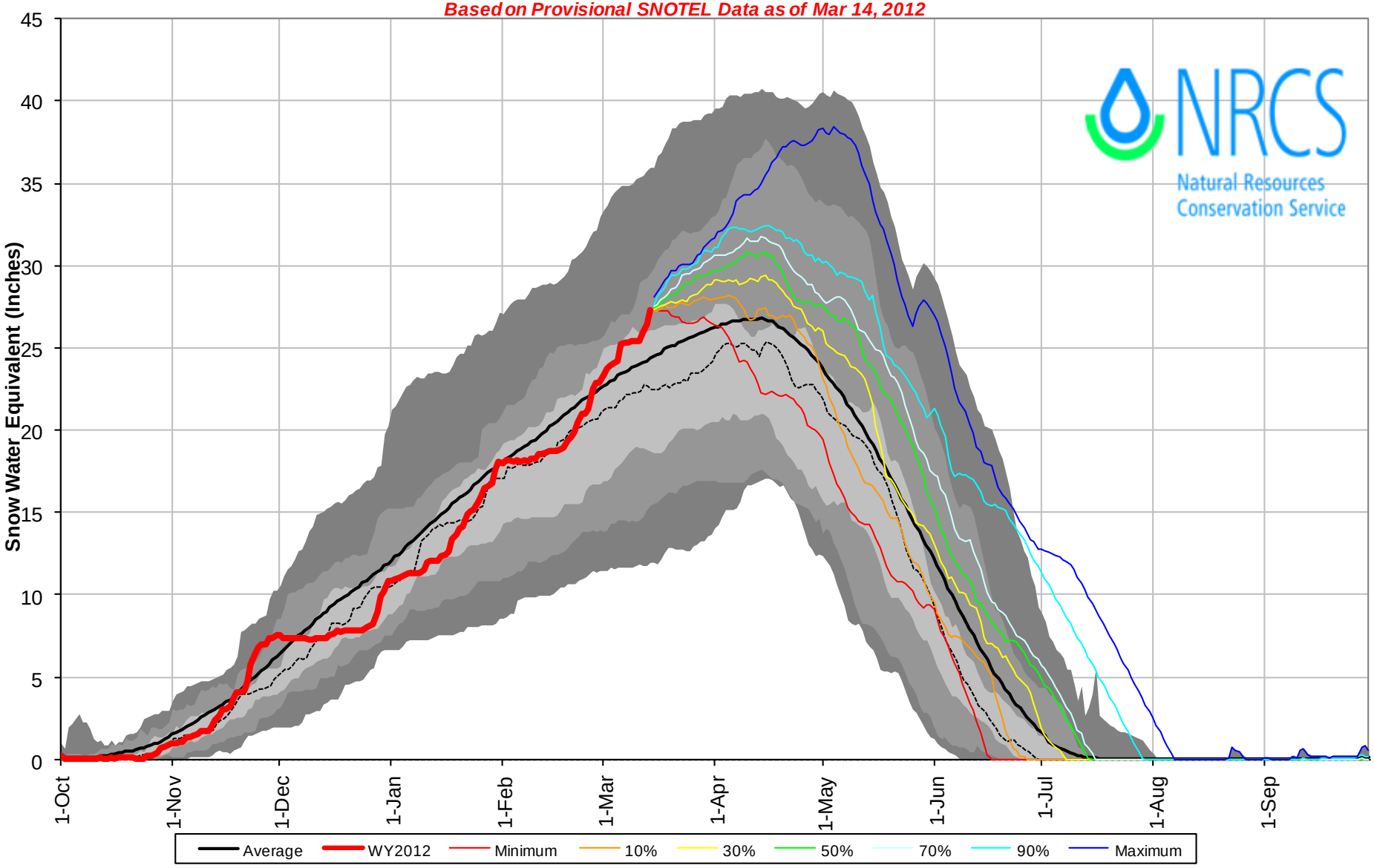
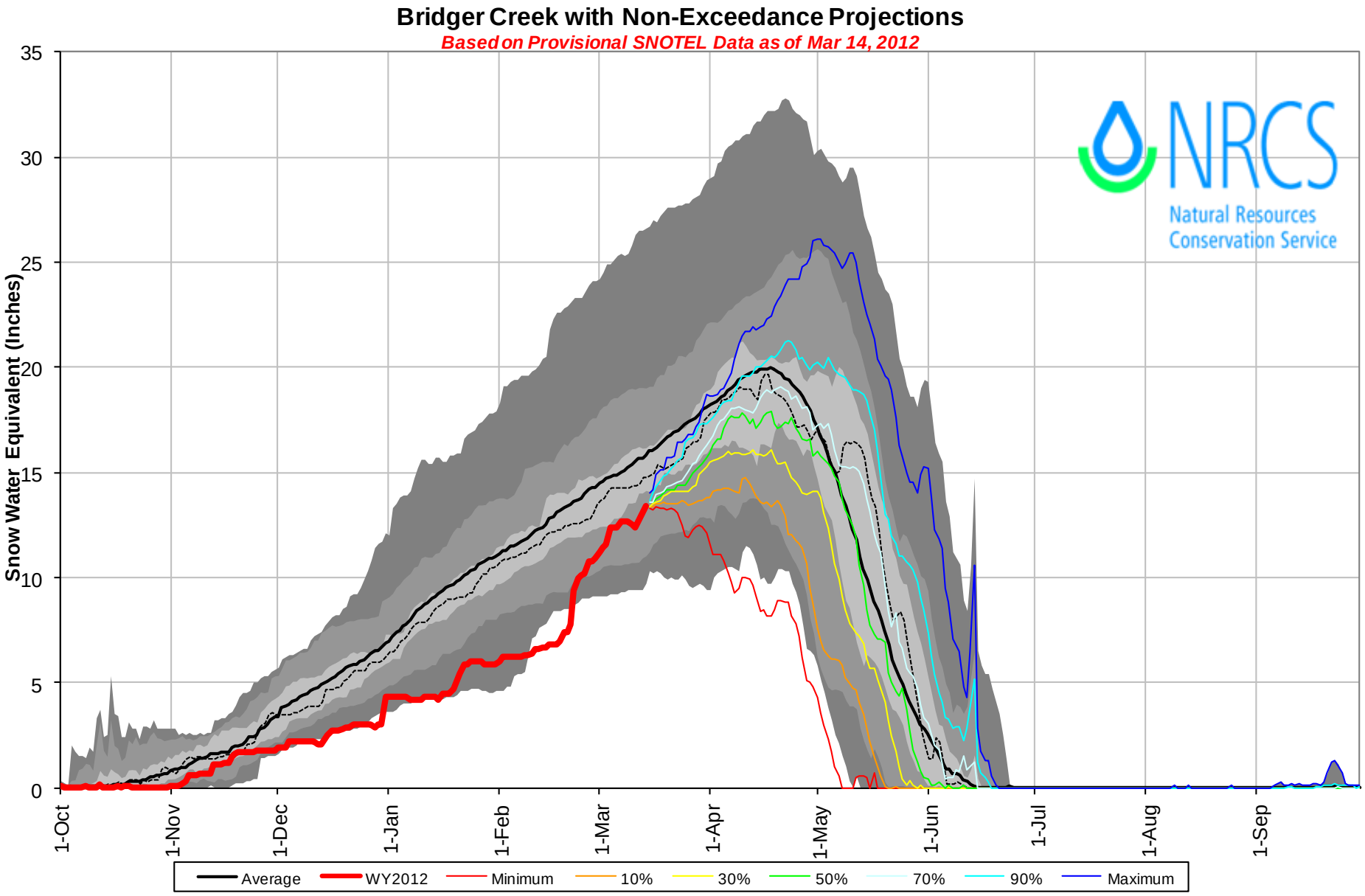
406-587-6991

www.mt.nrcs.usda.gov/snow/

Kootenai River Basin in Montana with Non-Exceedance Projections

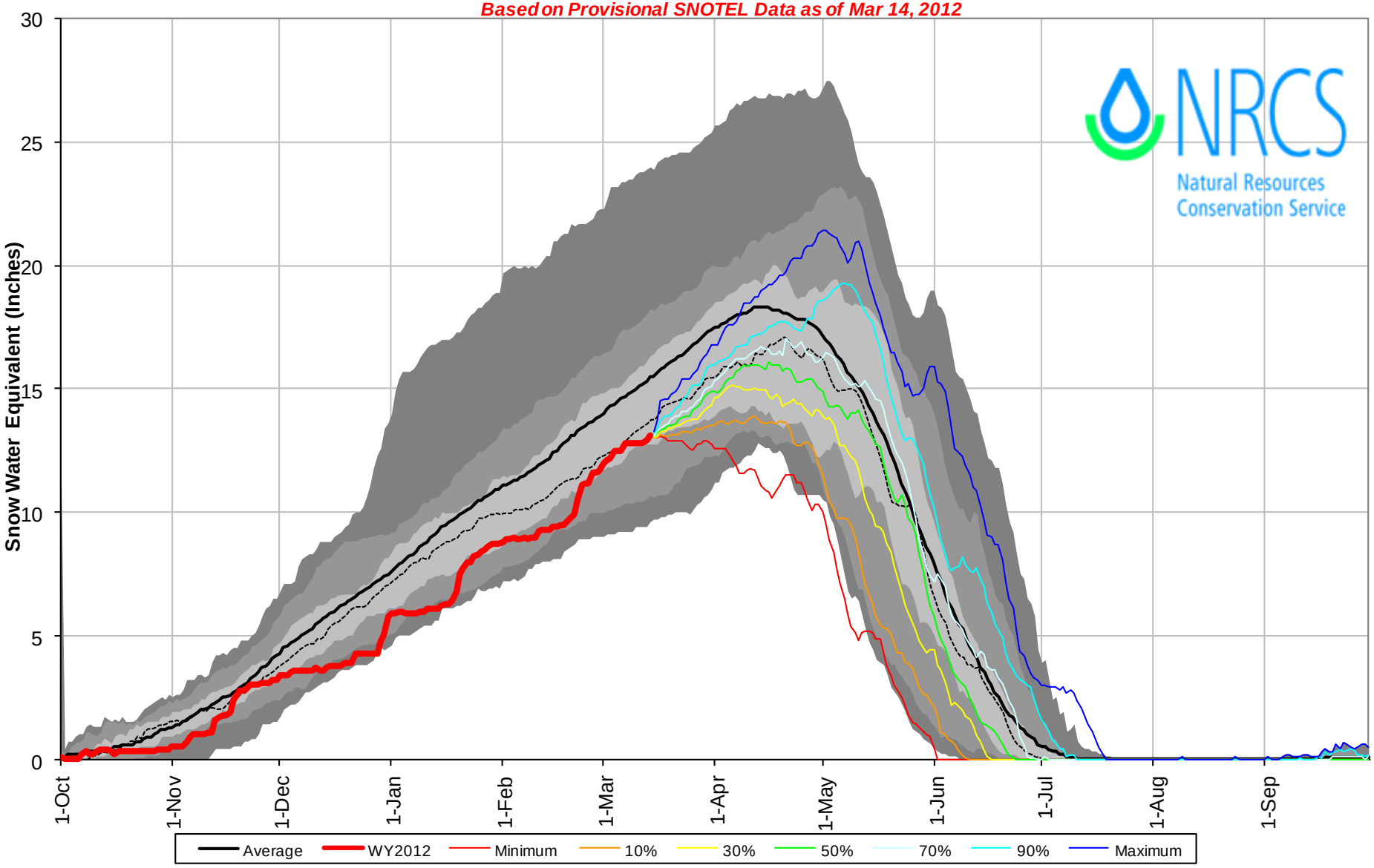
Based on Provisional SNOTEL Data as of Mar 14, 2012

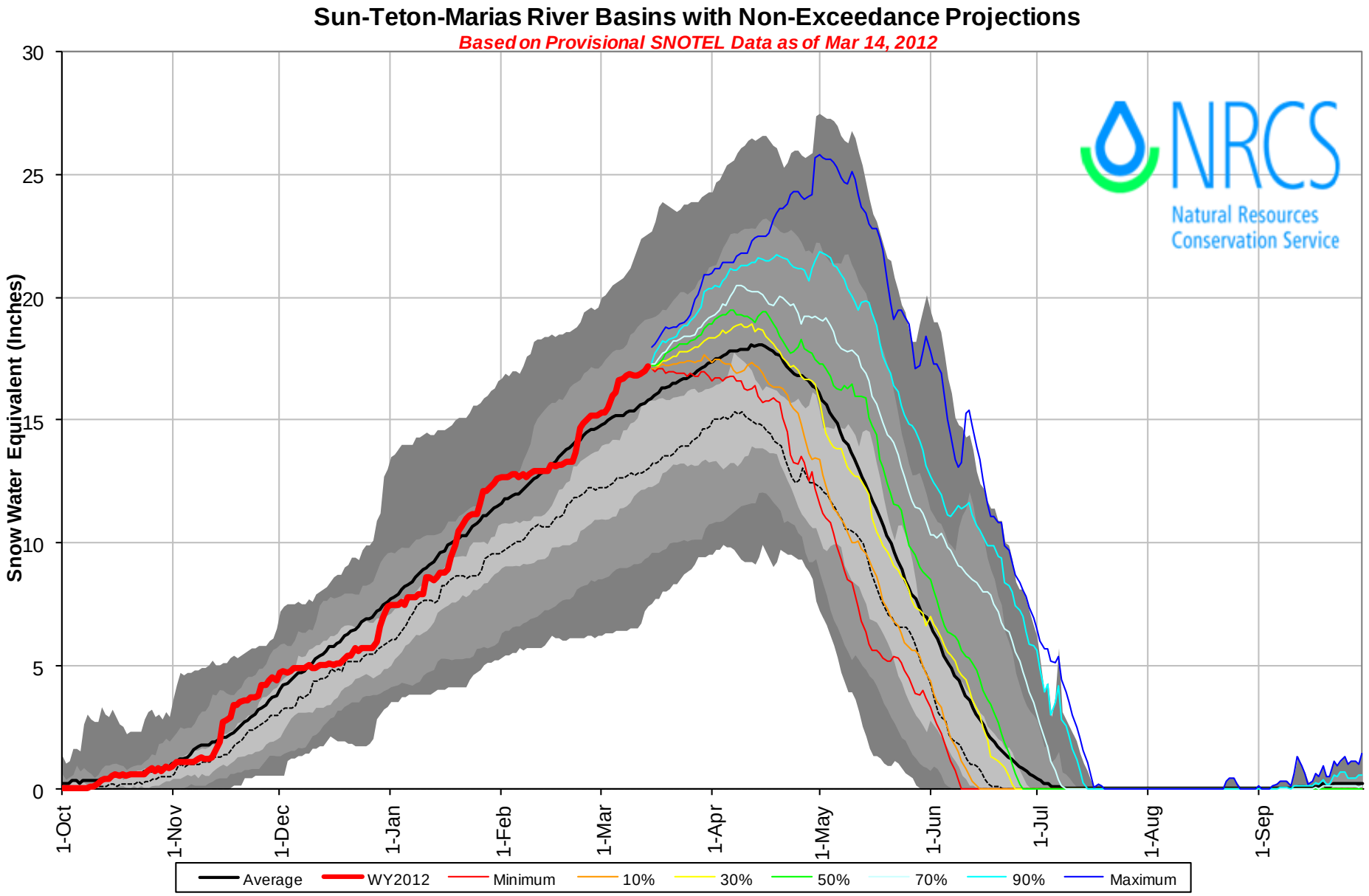


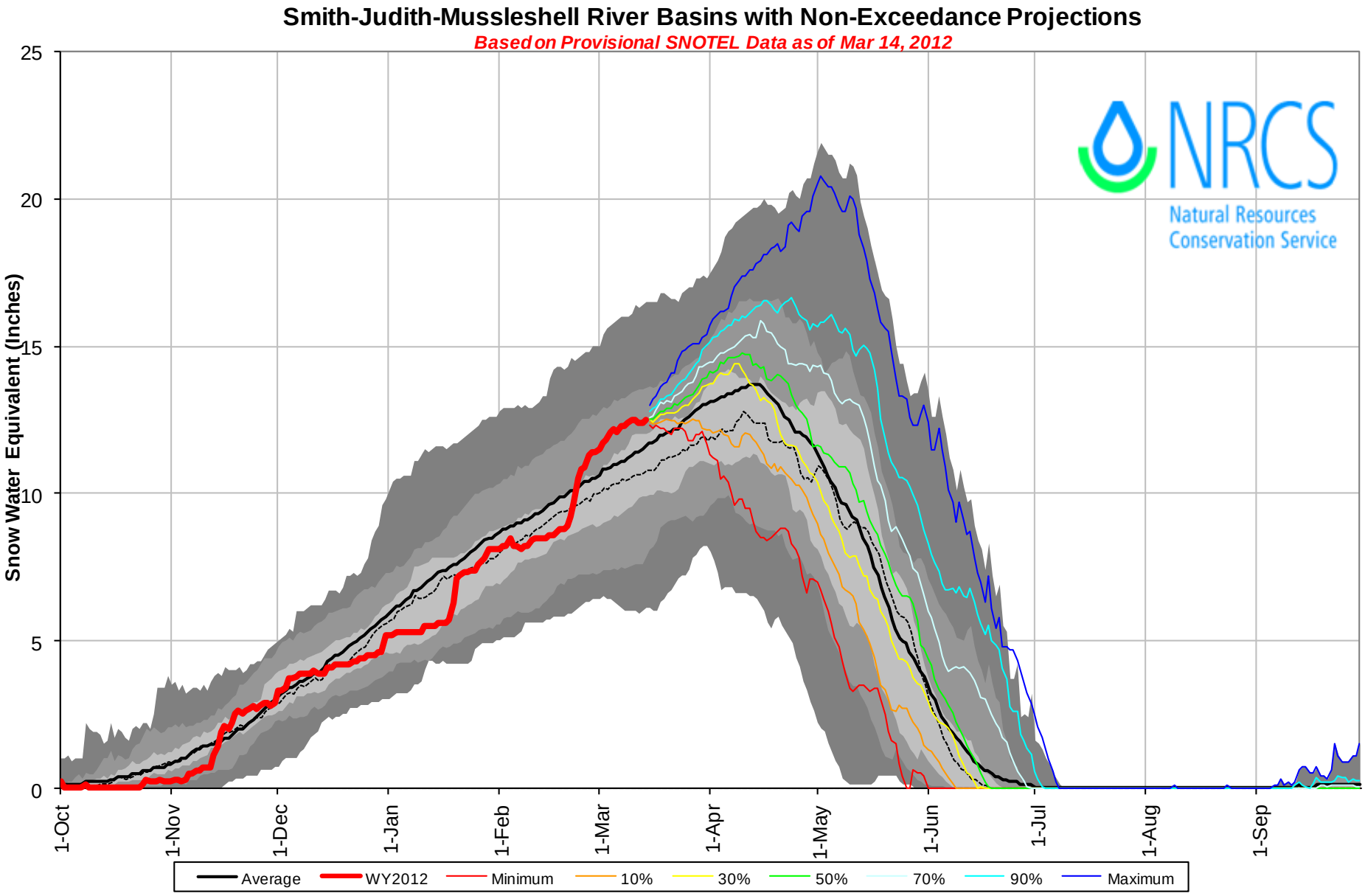

Bridger Creek with Non-Exceedance Projections
Based on Provisional SNOTEL Data as of Mar 14, 2012
Snow Water Equivalent (Inches)
35
30
25
20
15
10
5
0
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
NRCS
Natural Resources
Conservation Service
Average
WY2012
Minimum
10%
30%
50%
70%
90%
Maximum

Missouri Headwaters Basins with Non-Exceedance Projections

Based on Provisional SNOTEL Data as of Mar 14, 2012

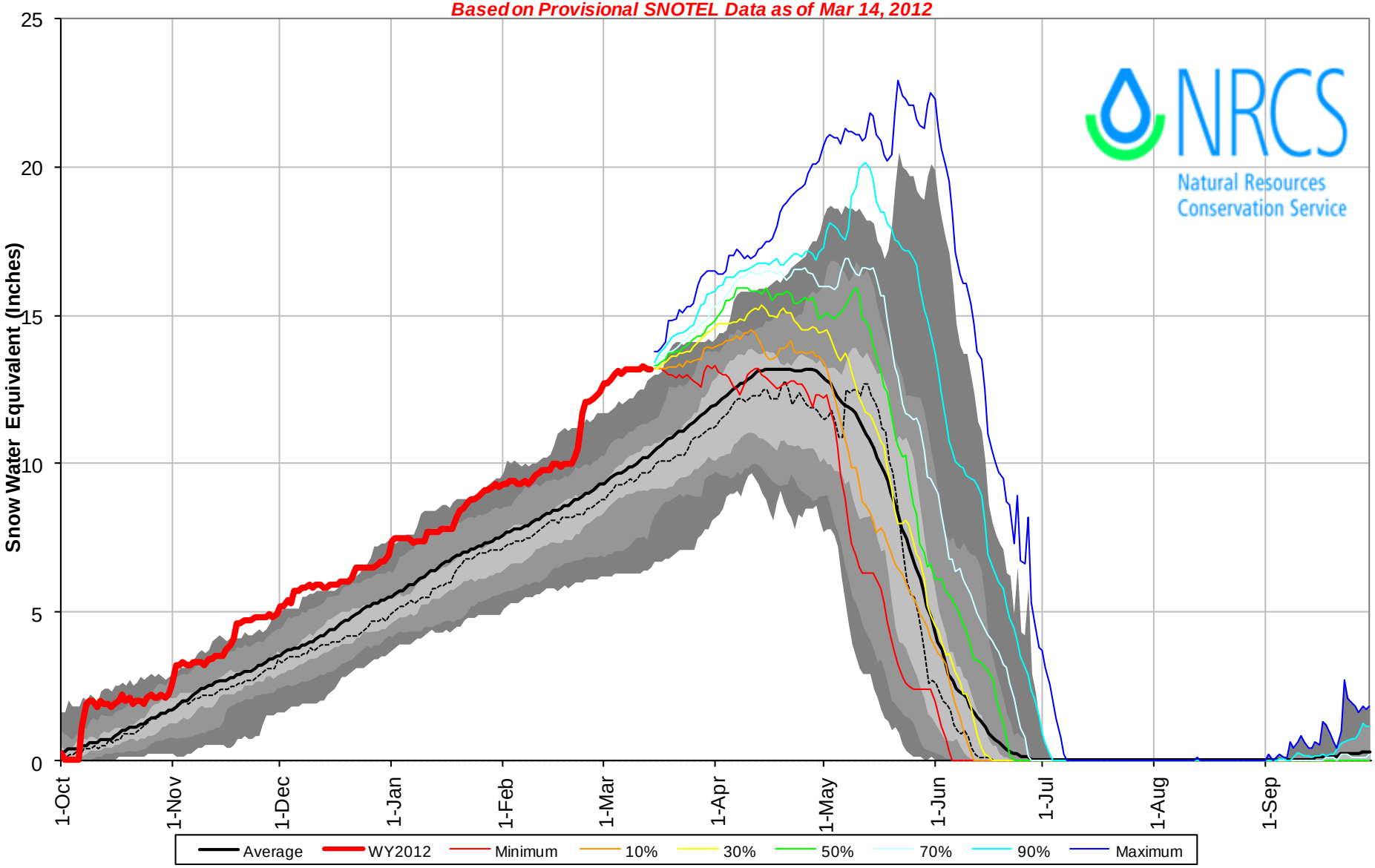


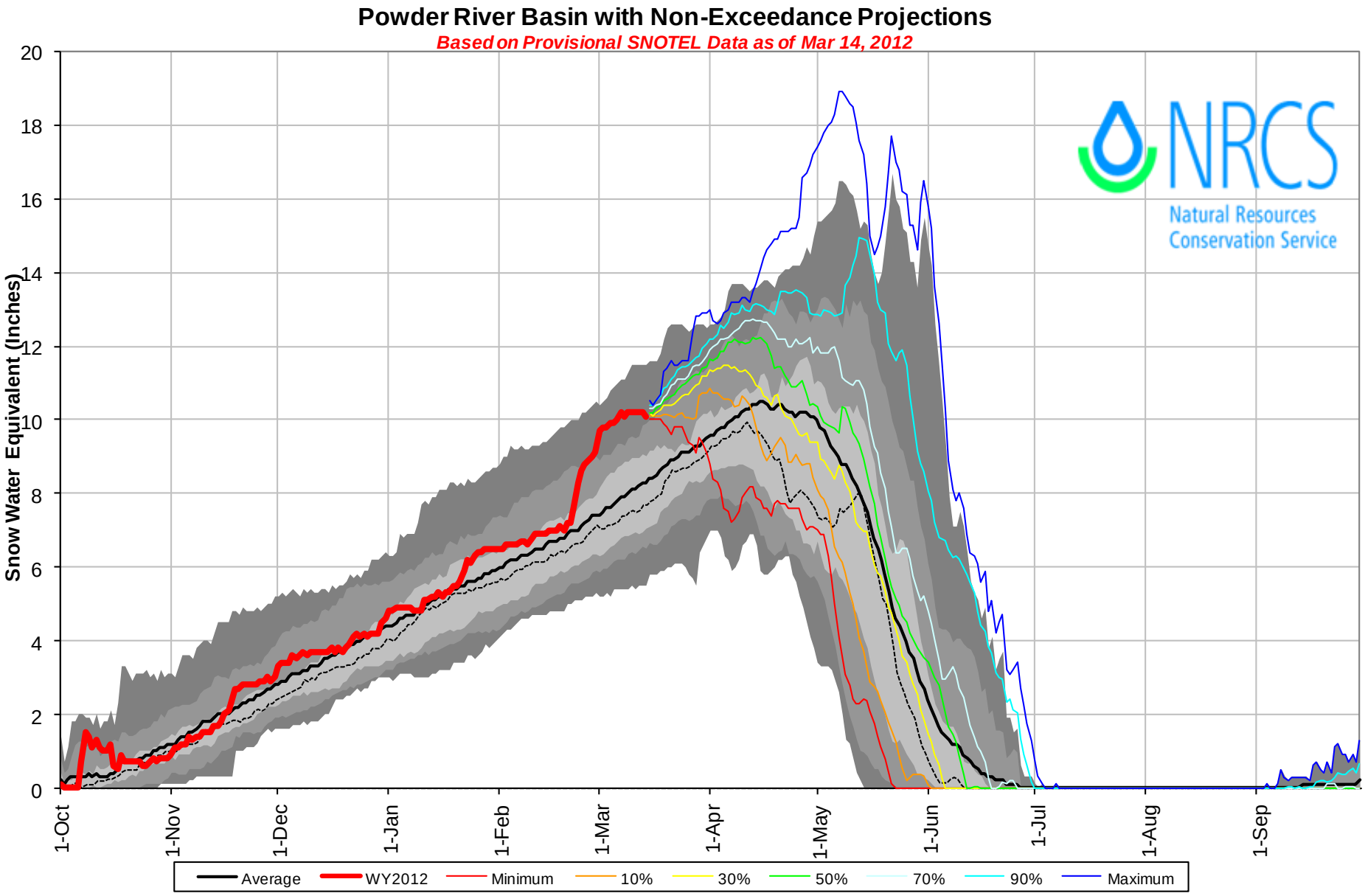

Sun-Teton-Marias River Basins with Non-Exceedance Projections
Based on Provisional SNOTEL Data as of Mar 14, 2012
Snow Water Equivalent (Inches)
30
25
20
15
10
5
0
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
Average
WY2012
Minimum
10%
30%
50%
70%
90%
Maximum
NRCS
Natural Resources
Conservation Service


Smith-Judith-Mussleshell River Basins with Non-Exceedance Projections
Based on Provisional SNOTEL Data as of Mar 14, 2012
Snow Water Equivalent (Inches)
25
20
15
10
5
0
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
Average
WY2012
Minimum
10%
30%
50%
70%
90%
Maximum
NRCS
Natural Resources
Conservation Service

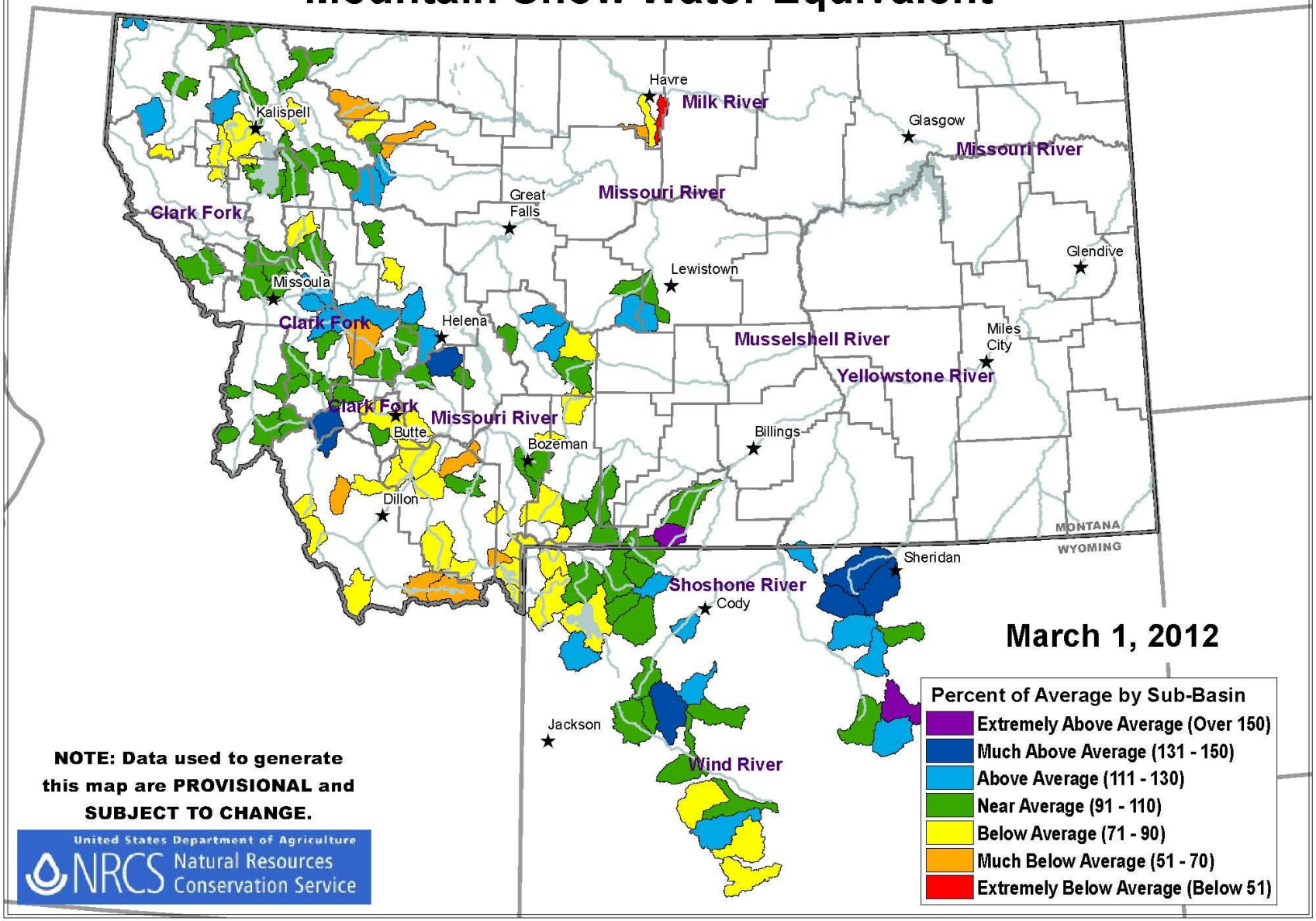
Tongue River Basin with Non-Exceedance Projections

Based on Provisional SNOTEL Data as of Mar 14, 2012



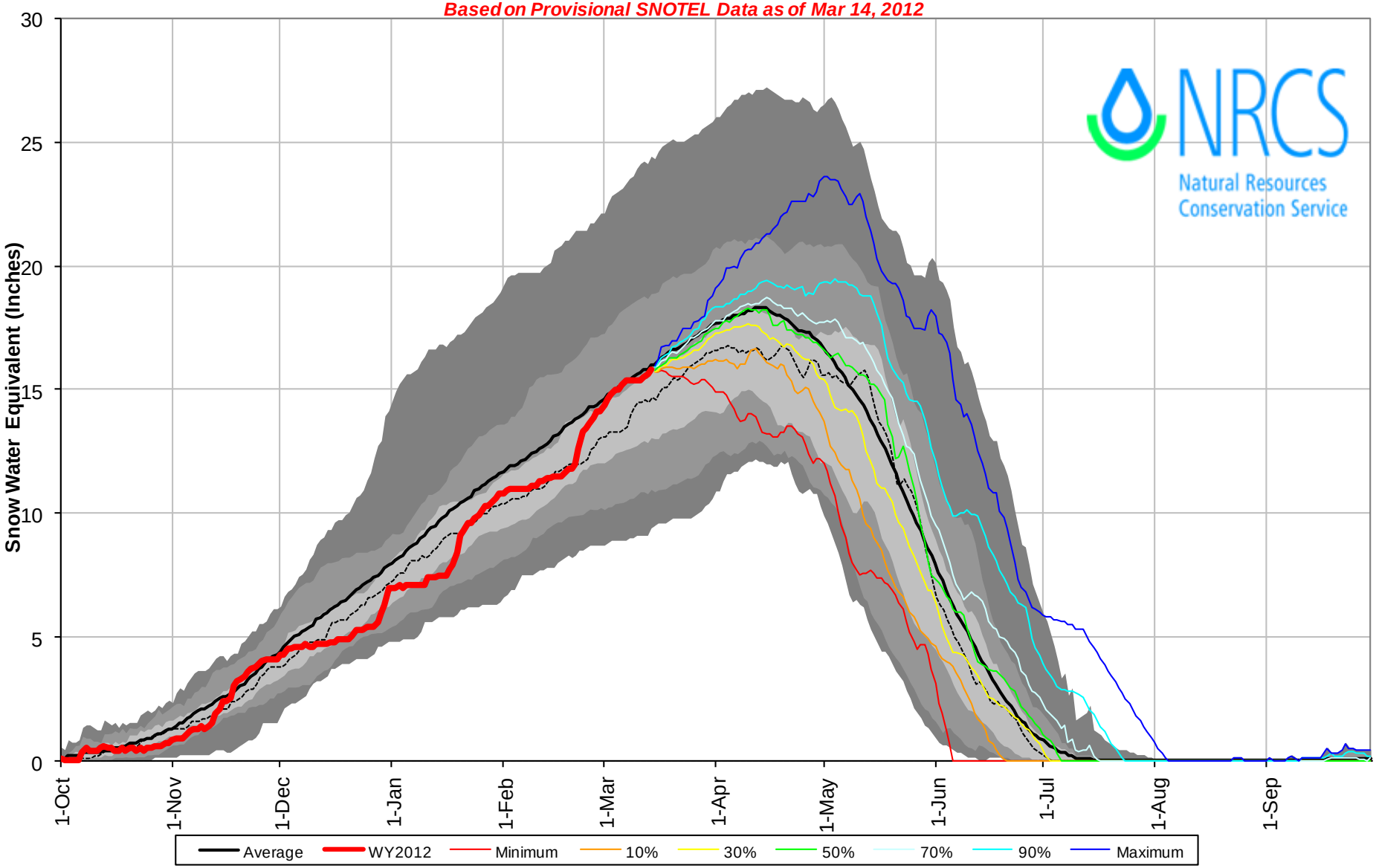

Powder River Basin with Non-Exceedance Projections
Based on Provisional SNOTEL Data as of Mar 14, 2012
Snow Water Equivalent (Inches)
0
2
4
6
8
10
12
14
16
18
20
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
Average
WY2012
Minimum
10%
30%
50%
70%
90%
Maximum
NRCS
Natural Resources
Conservation Service

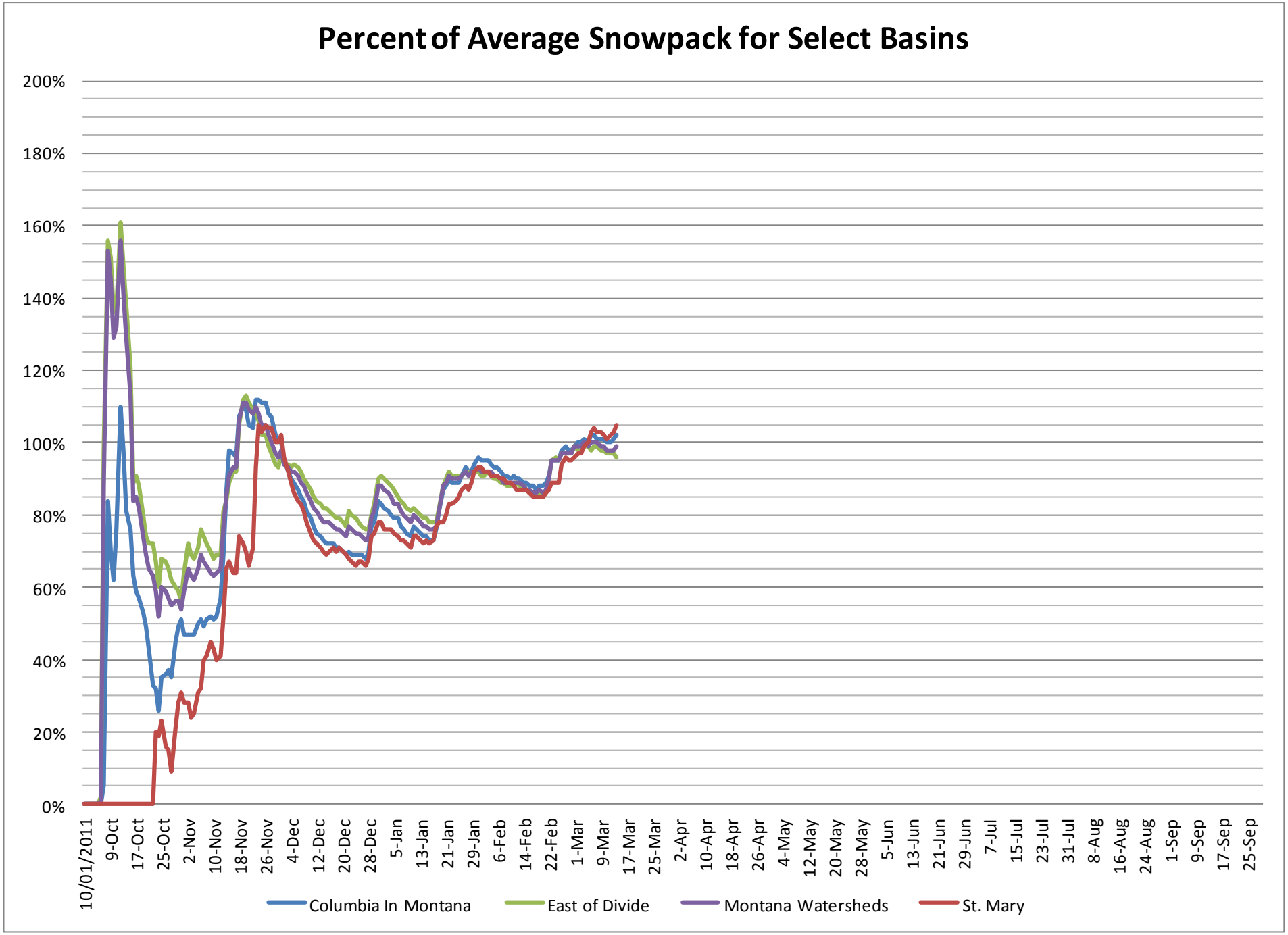
Mountain Snow Water Equivalent



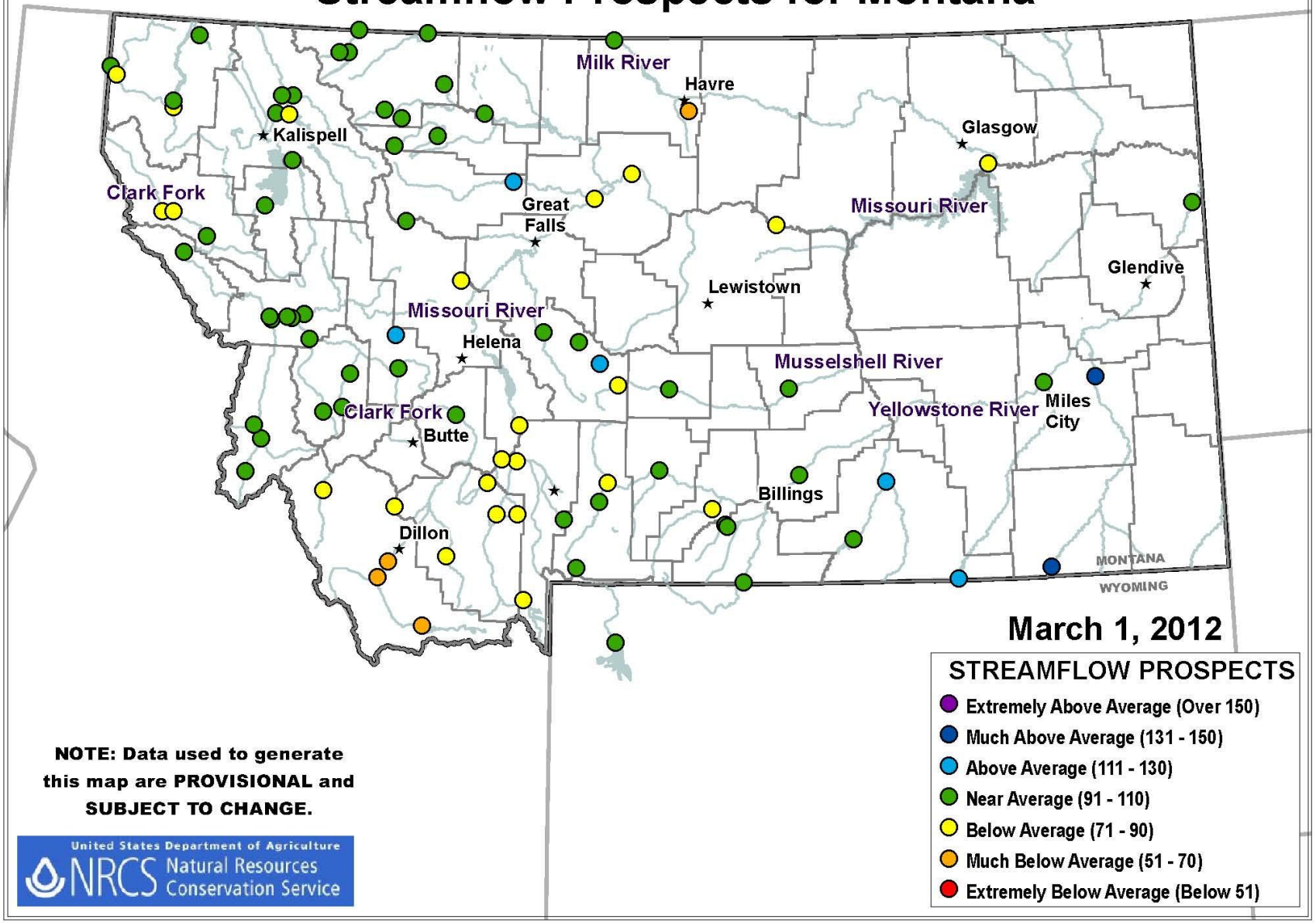
Montana Watersheds with Non-Exceedance Projections

Based on Provisional SNOTEL Data as of Mar 14, 2012




Percent of Average Snowpack for Select Basins
200%
180%
160%
140%
120%
100%
80%
60%
40%
20%
0%
10/01/2011
9-Oct
17-Oct
25-Oct
2-Nov
10-Nov
18-Nov
26-Nov
4-Dec
12-Dec
20-Dec
28-Dec
5-Jan
13-Jan
21-Jan
29-Jan
6-Feb
14-Feb
22-Feb
1-Mar
9-Mar
17-Mar
25-Mar
2-Apr
10-Apr
18-Apr
26-Apr
4-May
12-May
20-May
28-May
5-Jun
13-Jun
21-Jun
29-Jun
7-Jul
15-Jul
23-Jul
31-Jul
8-Aug
16-Aug
24-Aug
1-Sep
9-Sep
17-Sep
25-Sep
Columbia In Montana
East of Divide
Montana Watersheds
St. Mary

Streamflow Prospects for Montana



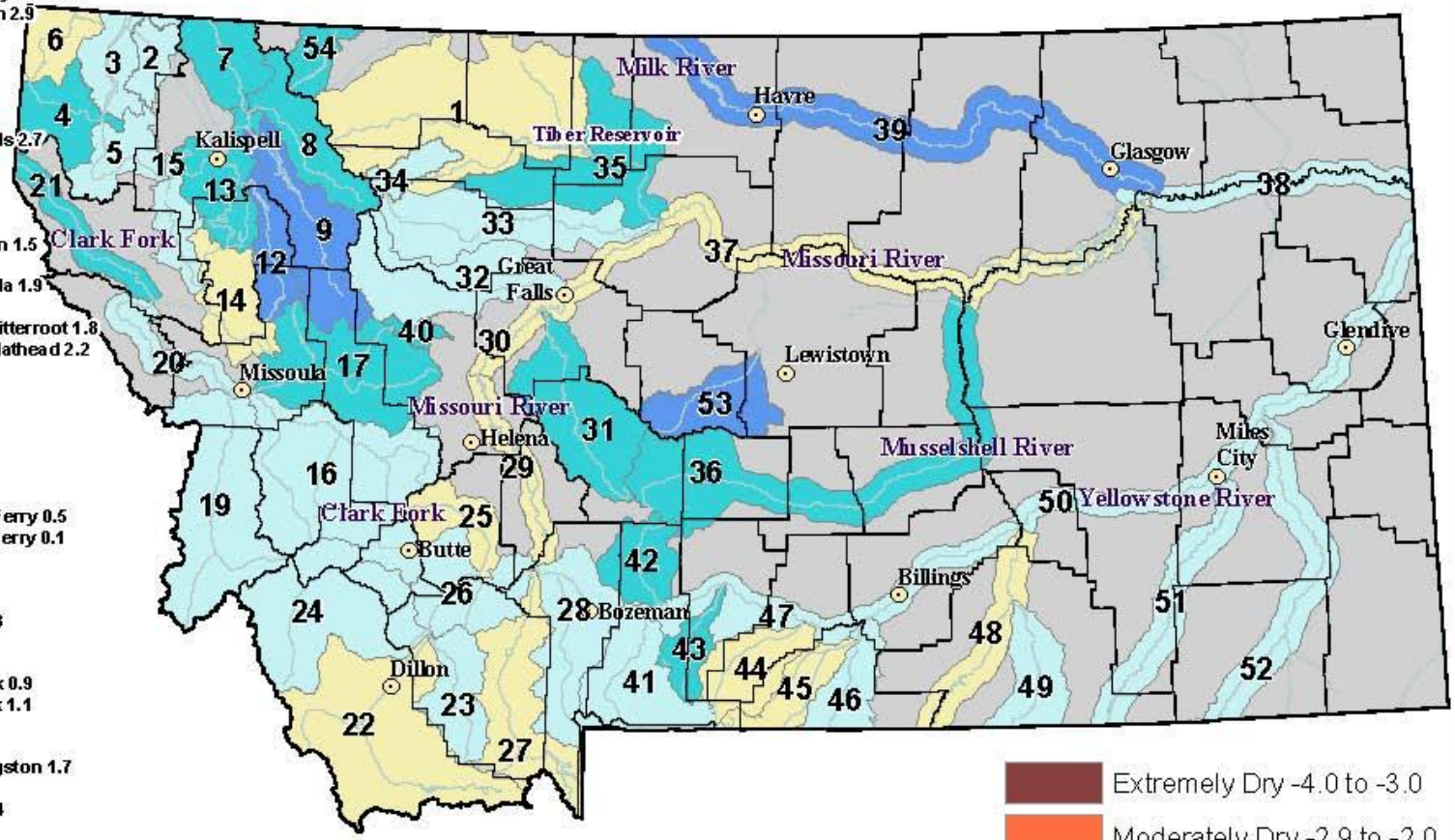
NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

United States Department of Agriculture
NRCS Natural Resources Conservation Service

Surface Water Supply Index (SWSI) Values

RIVER INDEX & SWSI VALUES

1 Marias above Tiber Reservoir 0.6
2 Tobacco 1.7
3 Kootenai Ft. Steele to Libby Dam 1.5
4 Kootenai below Libby Dam 2.9
5 Fisher 1.5
6 Yaak 0.8
7 North FK. Flathead 2.3
8 Middle FK. Flathead 2.1
9 South FK. Flathead 3.7
10 Flathead at Columbia Falls 2.7
12 Swan 3.4
13 Flathead at Polson 2.4
14 Mission Valley 0.0
15 Little Bitterroot 1.3
16 Clark Fork above Milltown 1.5
17 Blackfoot 2.4
18 Clark Fork above Missoula 1.9
19 Bitterroot 1.4
20 Clark Fork River below Bitterroot 1.8
21 Clark Fork River below Flathead 2.2
22 Beaverhead 0.8
23 Ruby 1.1
24 Big Hole 1.2
25 Boulder (Jefferson) 0.2
26 Jefferson 1.8
27 Madison 0.3
28 Gallatin 1.1
29 Missouri above Canyon Ferry 0.5
30 Missouri below Canyon Ferry 0.1
31 Smith 2.6
32 Sun 1.4
33 Teton 1.7
34 Birch/Dupuyer Creeks 1.3
35 Marias 2.7
36 Musselshell 2.4
37 Missouri above Fort Peck 0.9
38 Missouri below Fort Peck 1.1
39 Milk 3.1
40 Dearborn near Craig 2.0
41 Yellowstone above Livingston 1.7
42 Shields 2.1
43 Boulder (Yellowstone) 2.4
44 Stillwater -0.1
45 Rock/Red Lodge Creeks -0.9
46 Clarks Fork Yellowstone 1.5
47 Yellowstone above Bighorn River 1.5
48 Bighorn below Bighorn Lake 0.4
49 Little Bighorn 1.2
50 Yellowstone below Bighorn 1.0
51 Tongue 1.0
52 Powder 1.1
53 Upper Judith 3.5
54 Saint Mary 2.5



March 1, 2011

NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

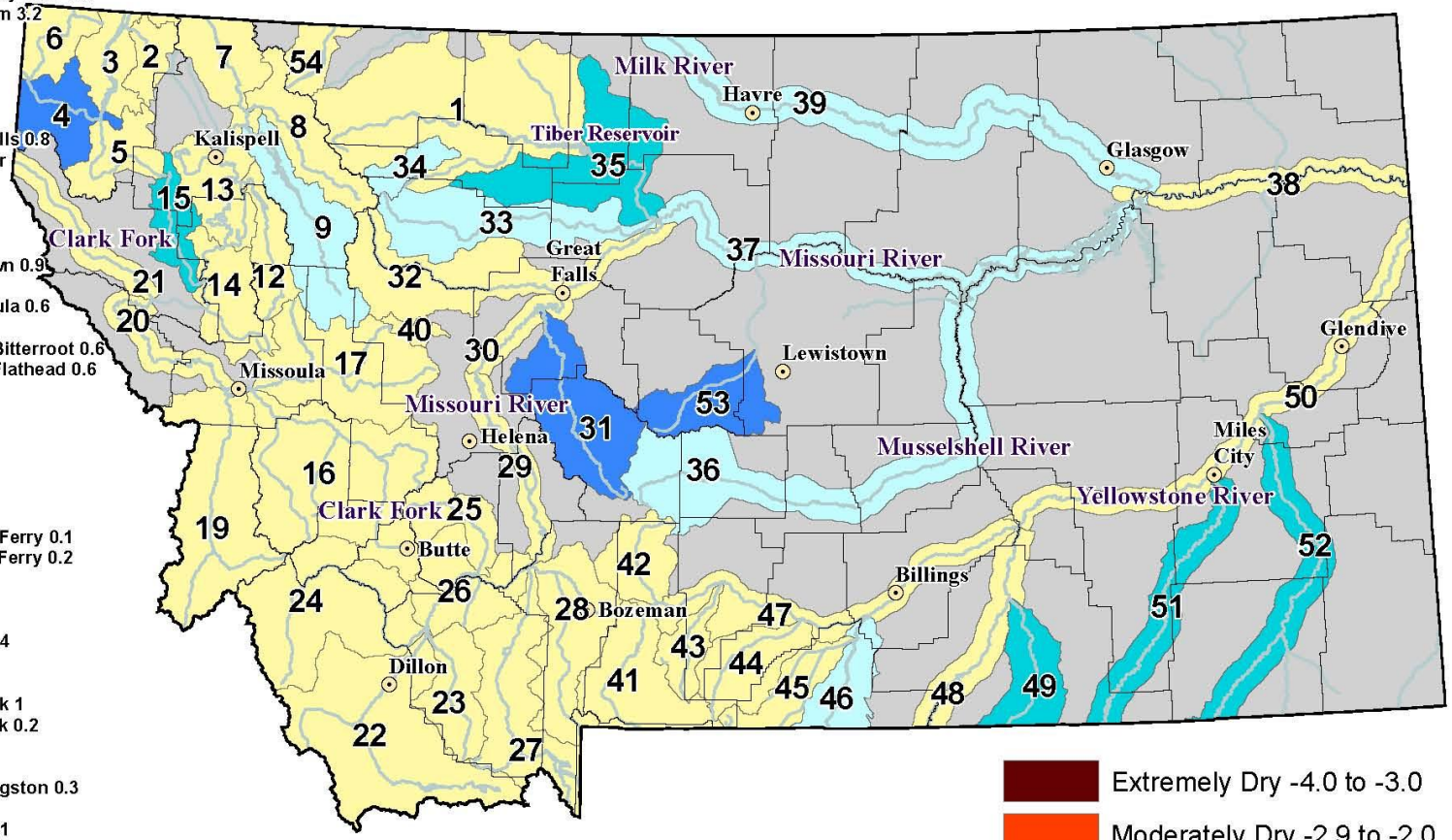
- Extremely Dry -4.0 to -3.0
- Moderately Dry -2.9 to -2.0
- Slightly Dry -1.9 to -1.0
- Near Average -0.9 to 0.9
- Slightly Wet 1.0 to 1.9
- Moderately Wet 2.0 to 2.9
- Extremely Wet 3.0 to 4.0
- SWSI Not Applicable

United States Department of Agriculture
NRCS Natural Resources Conservation Service

Surface Water Supply Index (SWSI) Values

RIVER INDEX & SWSI VALUES

1 Marias above Tiber Reservoir 0.1
2 Tobacco 0
3 Kootenai Ft. Steele to Libby Dam 0.8
4 Kootenai below Libby Dam 3.2
5 Fisher -0.4
6 Yaak -0.1
7 North FK. Flathead 0.6
8 Middle FK. Flathead 0.5
9 South FK. Flathead 1.8
10 Flathead at Columbia Falls 0.8
11 Stillwater/Whitefish River
12 Swan 0.2
13 Flathead at Polson 0.6
14 Mission Valley 0.7
15 Little Bitterroot 2.1
16 Clark Fork above Milltown 0.9
17 Blackfoot 0.4
18 Clark Fork above Missoula 0.6
19 Bitterroot 0.7
20 Clark Fork River below Bitterroot 0.6
21 Clark Fork River below Flathead 0.6
22 Beaverhead 0.3
23 Ruby -0.6
24 Big Hole -0.8
25 Boulder (Jefferson) 0.4
26 Jefferson 0.7
27 Madison -0.8
28 Gallatin -0.8
29 Missouri above Canyon Ferry 0.1
30 Missouri below Canyon Ferry 0.2
31 Smith 3.2
32 Sun 0.4
33 Teton 1.7
34 Birch/Dupuyer Creeks 1.4
35 Marias 2
36 Musselshell 1.4
37 Missouri above Fort Peck 1
38 Missouri below Fort Peck 0.2
39 Milk 1.6
40 Dearborn near Craig 0.5
41 Yellowstone above Livingston 0.3
42 Shields -0.2
43 Boulder (Yellowstone) 0.1
44 Stillwater -0.8
45 Rock/Red Lodge Creeks 0.2
46 Clarks Fork Yellowstone 1.2
47 Yellowstone above Bighorn River 0.2
48 Bighorn below Bighorn Lake 0.8
49 Little Bighorn 2.4
50 Yellowstone below Bighorn 0.5
51 Tongue 2.9
52 Powder 2.3
53 Upper Judith 4
54 Saint Mary 0.7

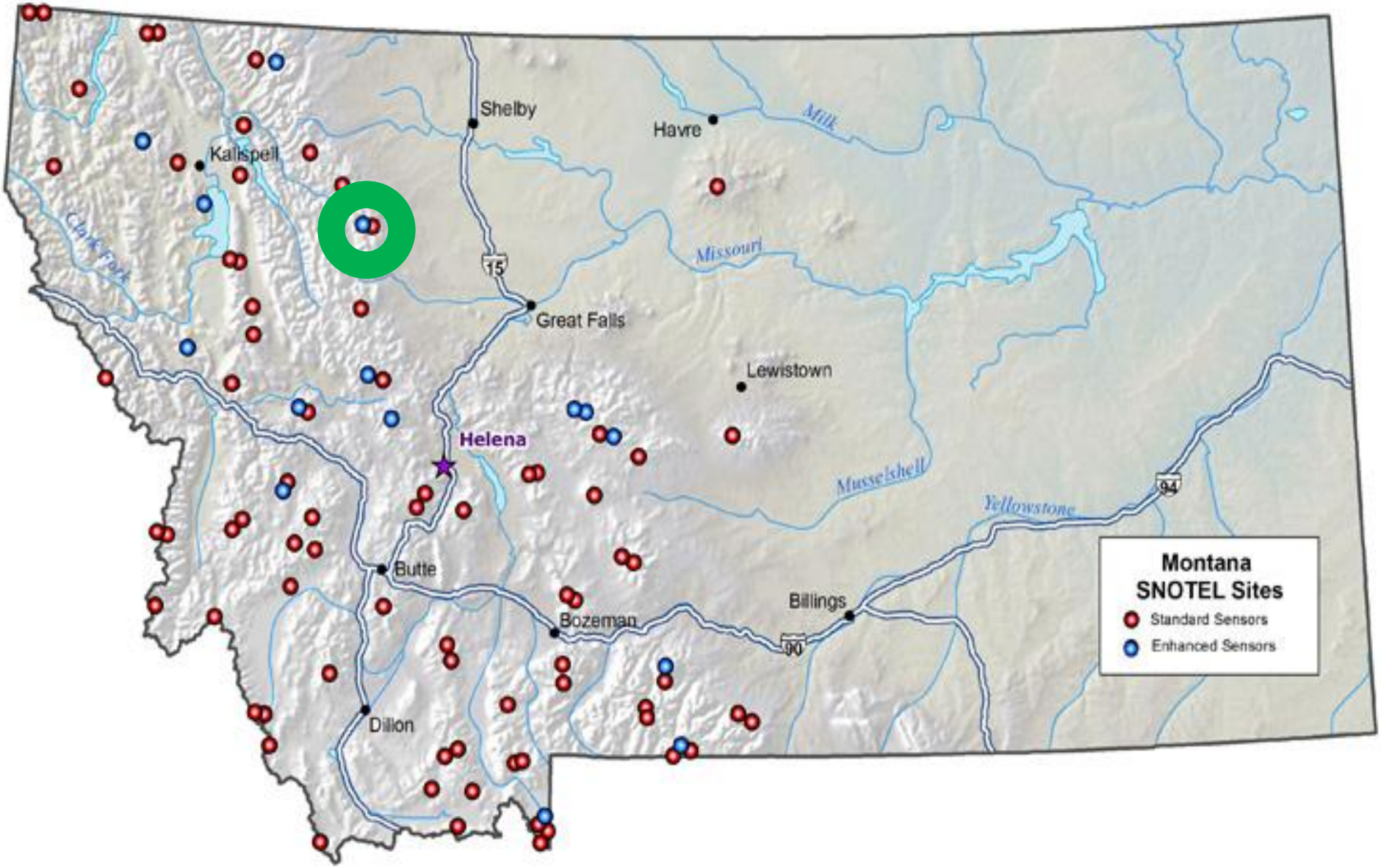


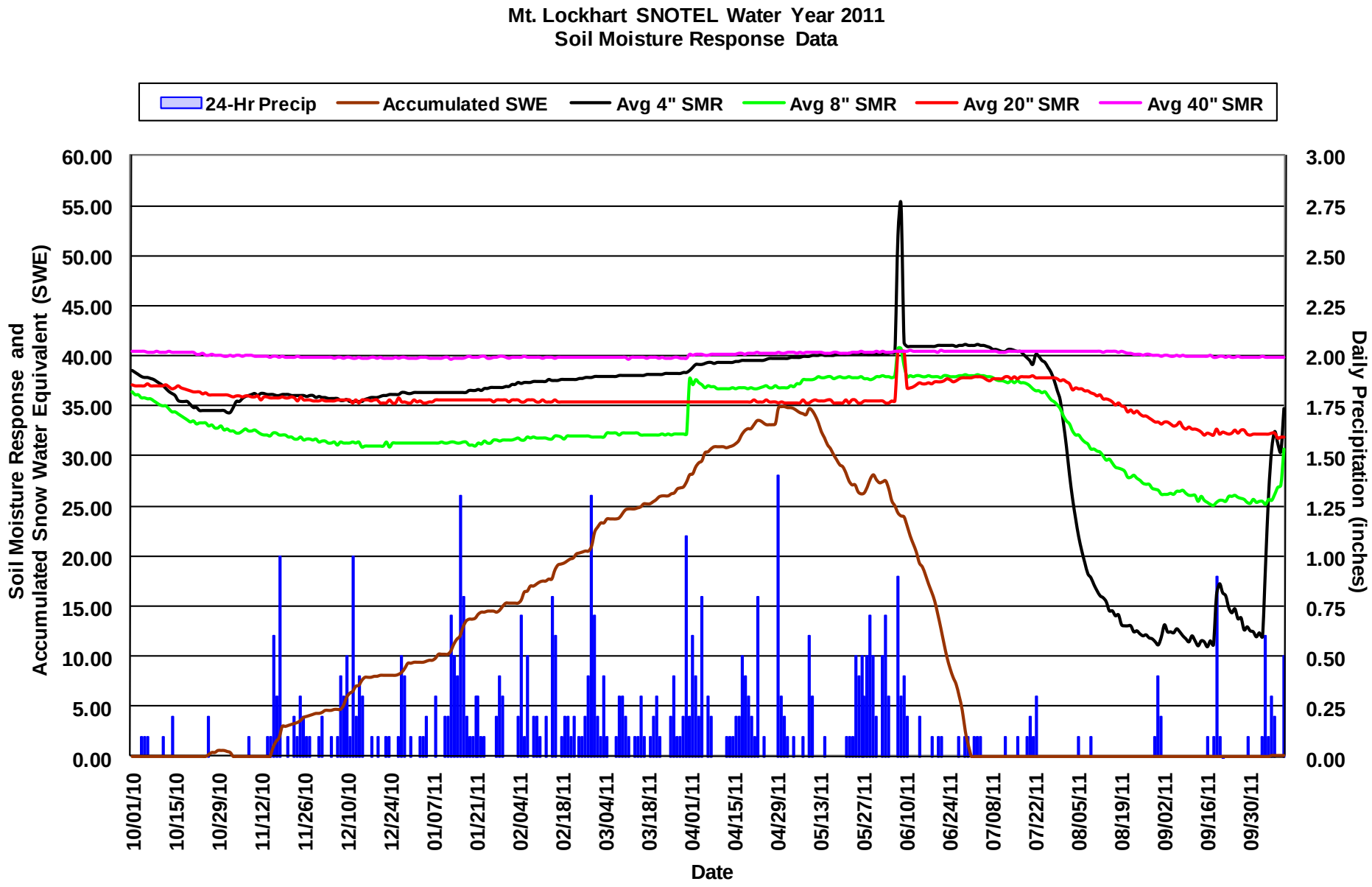
March 7, 2012

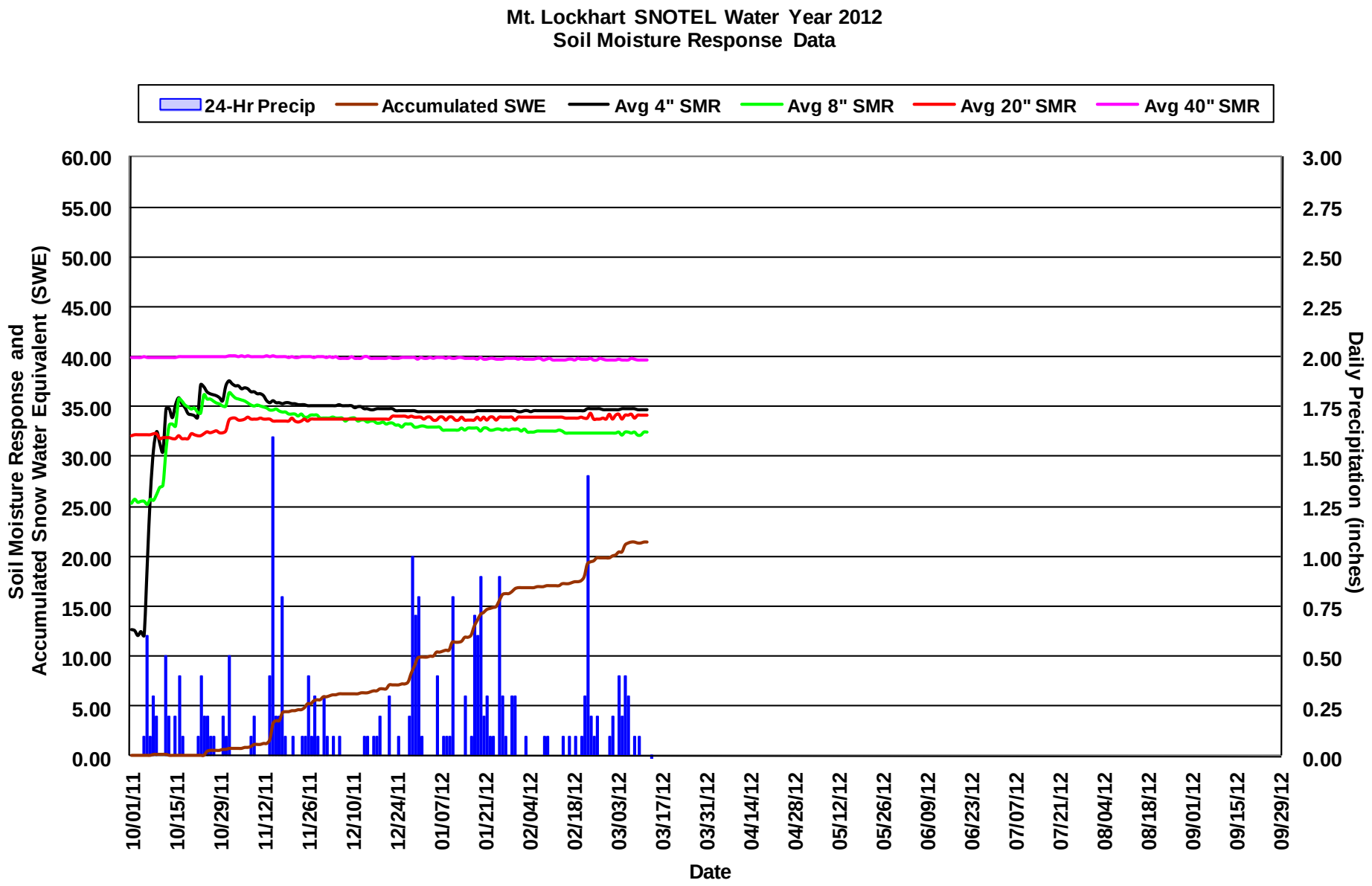
NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

- Extremely Dry -4.0 to -3.0
- Moderately Dry -2.9 to -2.0
- Slightly Dry -1.9 to -1.0
- Near Average -0.9 to 0.9
- Slightly Wet 1.0 to 1.9
- Moderately Wet 2.0 to 2.9
- Extremely Wet 3.0 to 4.0
- SWSI Not Applicable

United States Department of Agriculture
NRCS Natural Resources Conservation Service


Montana
SNOTEL Sites
Standard Sensors
Enhanced Sensors
Shelby
Havre
Milk
Kalispell
Clark Fork
Missouri
15
Great Falls
Lewistown
Helena
Musselshell
Yellowstone
94
Butte
Billings
Bozeman
90
Dillon


Mt. Lockhart SNOTEL Water Year 2011
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
10/01/10
10/15/10
10/29/10
11/12/10
11/26/10
12/10/10
12/24/10
01/07/11
01/21/11
02/04/11
02/18/11
03/04/11
03/18/11
04/01/11
04/15/11
04/29/11
05/13/11
05/27/11
06/10/11
06/24/11
07/08/11
07/22/11
08/05/11
08/19/11
09/02/11
09/16/11
09/30/11
Date


Mt. Lockhart SNOTEL Water Year 2012
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
Date
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
10/01/11
10/15/11
10/29/11
11/12/11
11/26/11
12/10/11
12/24/11
01/07/12
01/21/12
02/04/12
02/18/12
03/03/12
03/17/12
03/31/12
04/14/12
04/28/12
05/12/12
05/26/12
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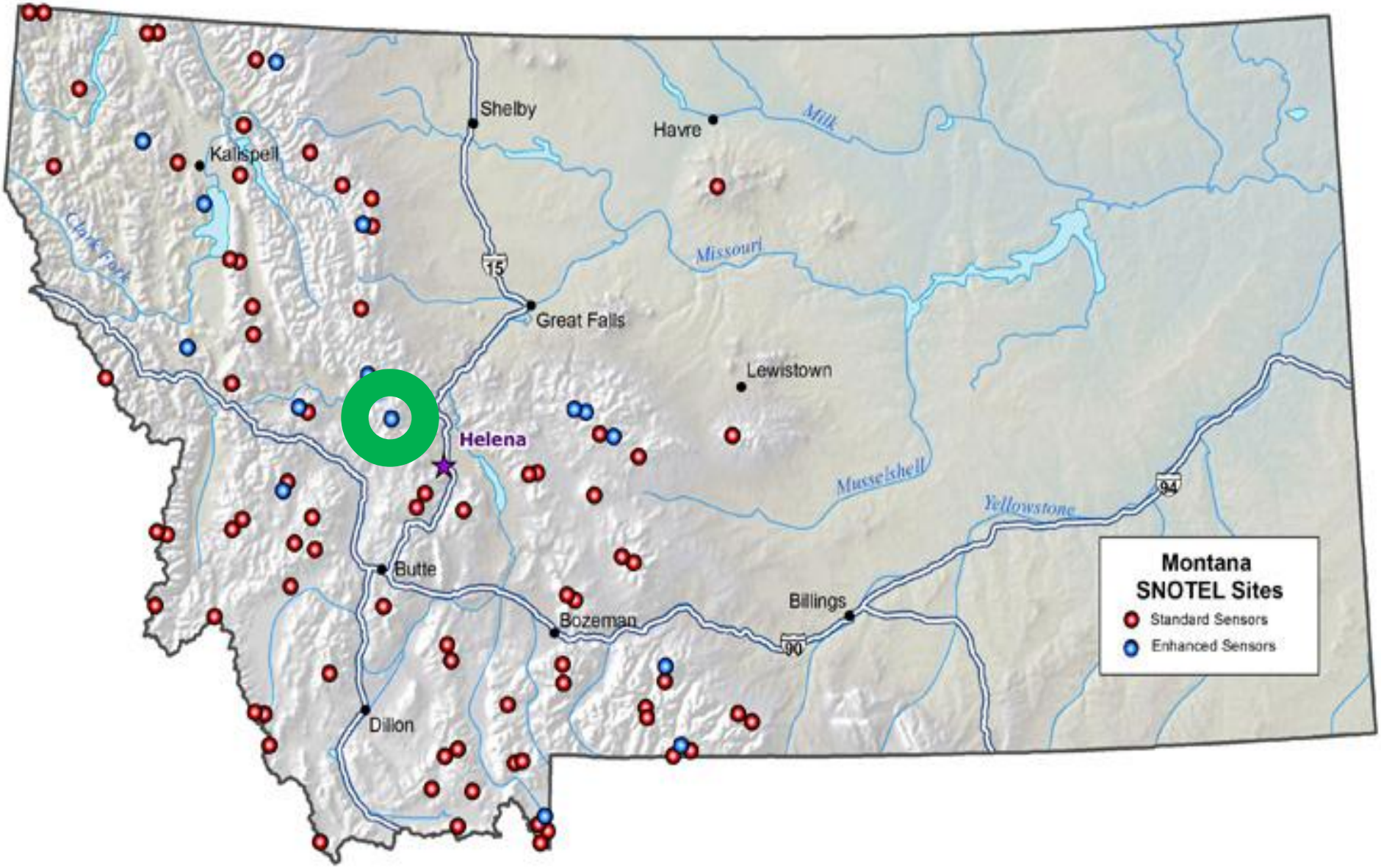
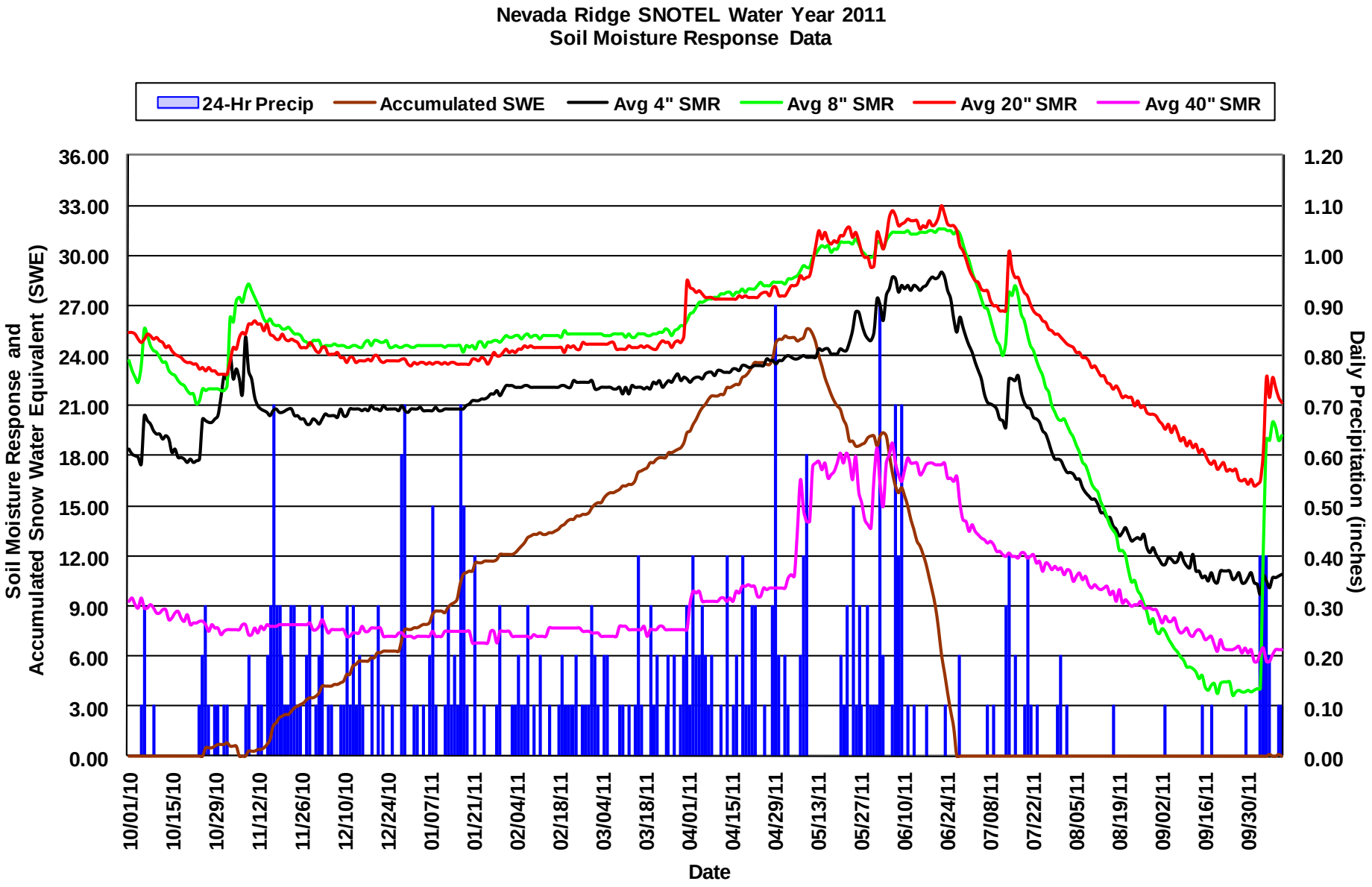
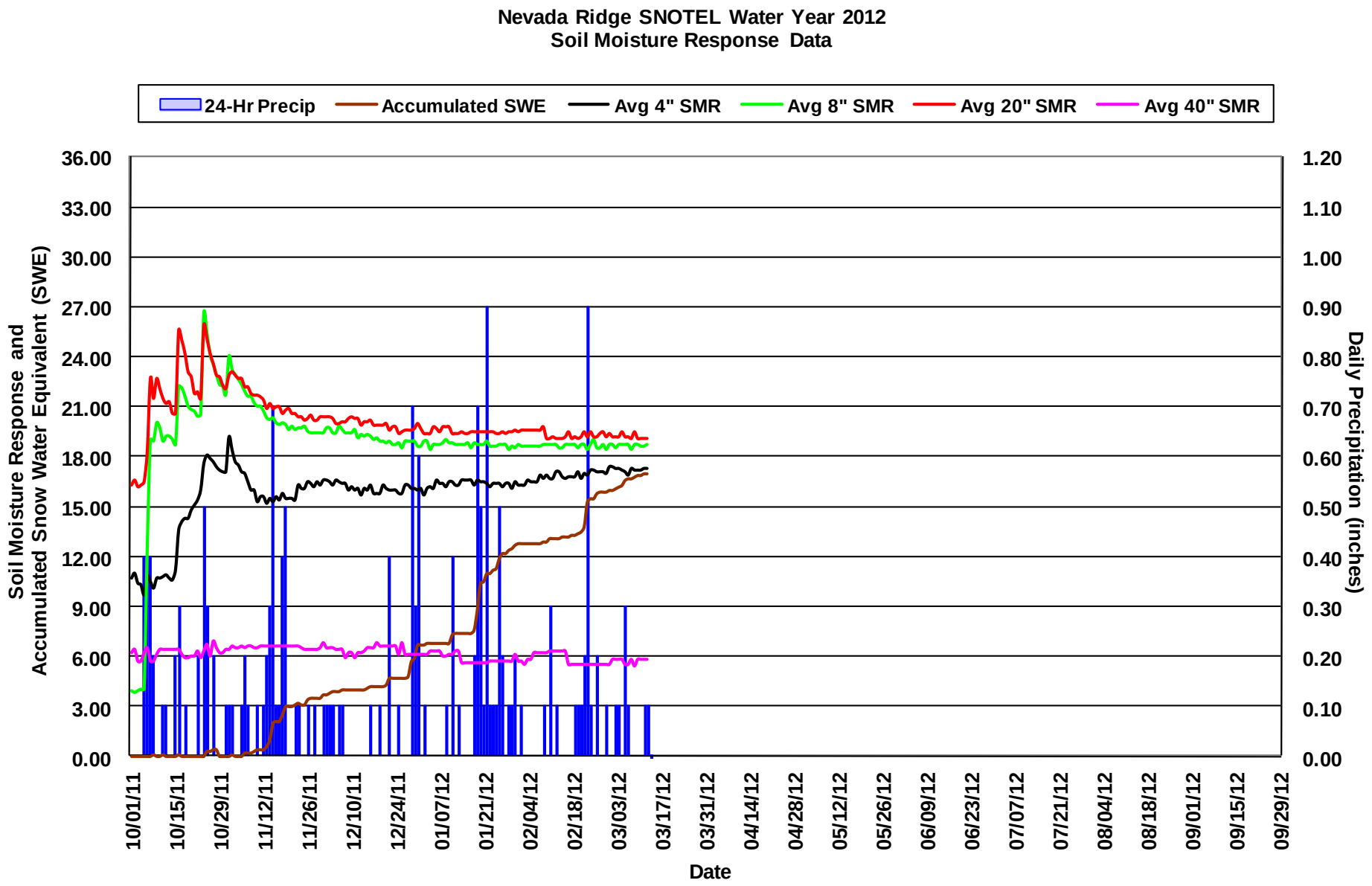
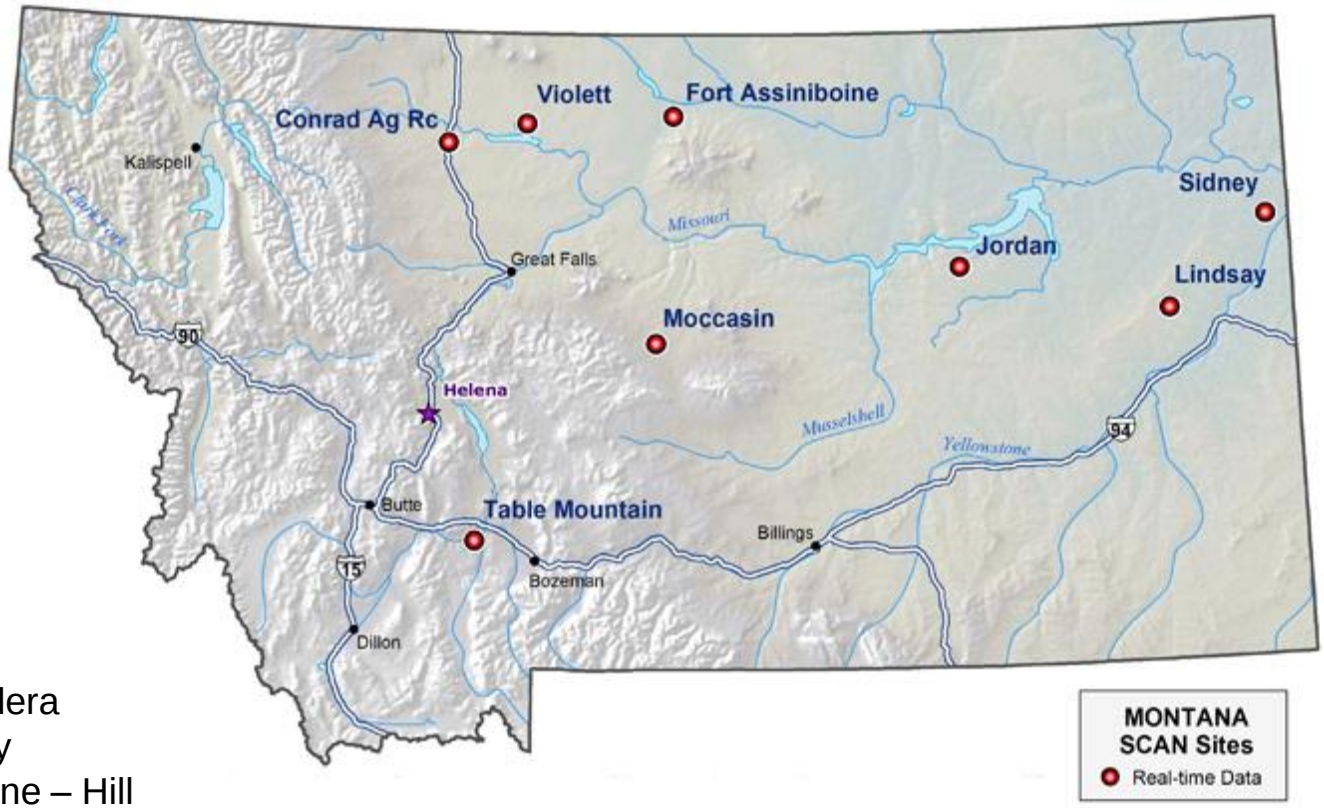
09/15/12
09/29/12


Shelby
Havre
Milk
Kalispell
Clark Fork
Missouri
15
Great Falls
Lewistown
Helena
Musselshell
Yellowstone
94
Butte
Billings
Bozeman
90
Dillon
Montana
SNOTEL Sites
Standard Sensors
Enhanced Sensors


Nevada Ridge SNOTEL Water Year 2011
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
36.00
33.00
30.00
27.00
24.00
21.00
18.00
15.00
12.00
9.00
6.00
3.00
0.00
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
10/01/10
10/15/10
10/29/10
11/12/10
11/26/10
12/10/10
12/24/10
01/07/11
01/21/11
02/04/11
02/18/11
03/04/11
03/18/11
04/01/11
04/15/11
04/29/11
05/13/11
05/27/11
06/10/11
06/24/11
07/08/11
07/22/11
08/05/11
08/19/11
09/02/11
09/16/11
09/30/11
Date

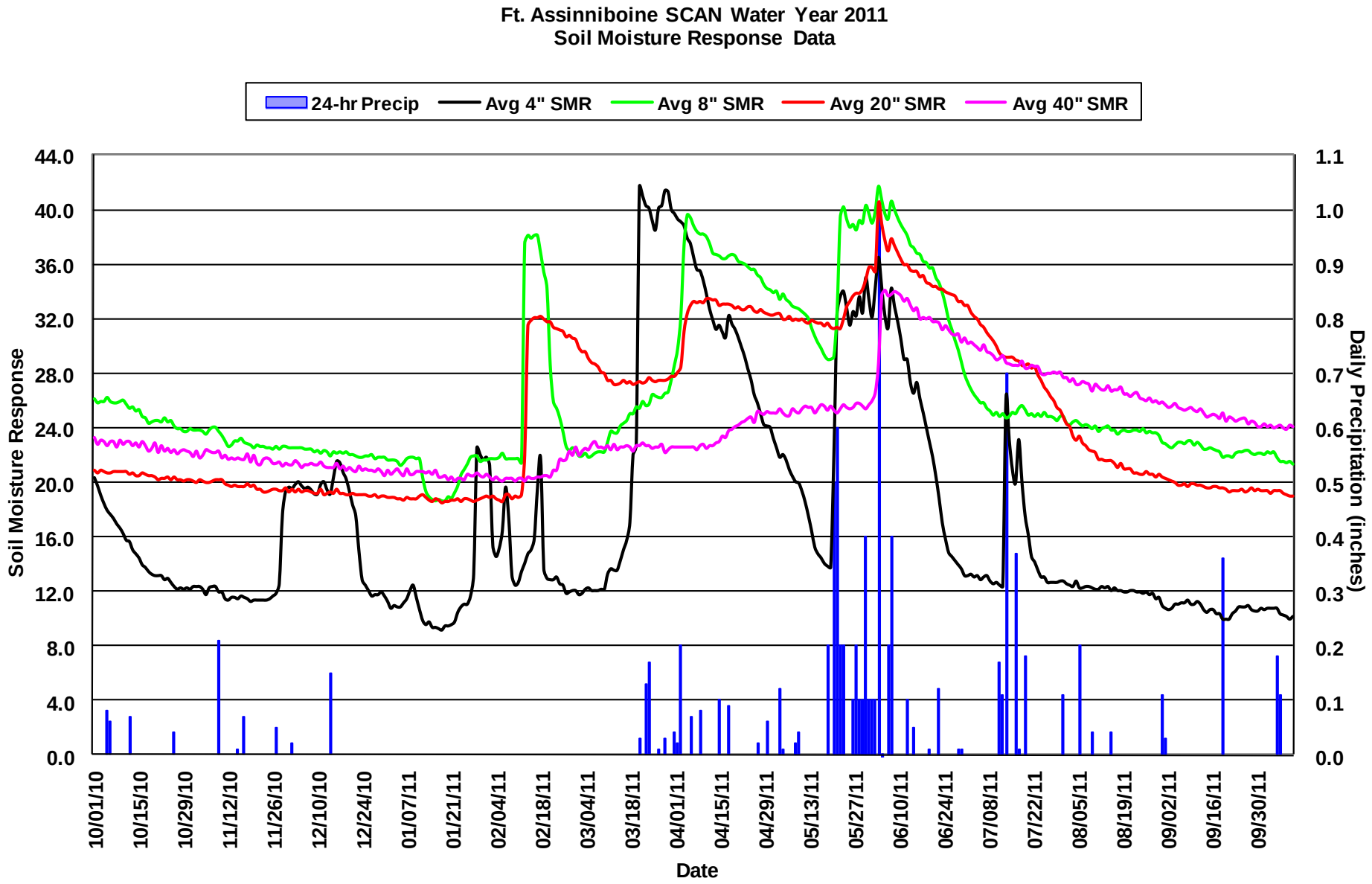

Nevada Ridge SNOTEL Water Year 2012
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
36.00
33.00
30.00
27.00
24.00
21.00
18.00
15.00
12.00
9.00
6.00
3.00
0.00
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
10/01/11
10/15/11
10/29/11
11/12/11
11/26/11
12/10/11
12/24/11
01/07/12
01/21/12
02/04/12
02/18/12
03/03/12
03/17/12
03/31/12
04/14/12
04/28/12
05/12/12
05/26/12
06/09/12
06/23/12
07/07/12
07/21/12
08/04/12
08/18/12
09/01/12
09/15/12
09/29/12
Date

MONTANA SOIL CLIMATE ANALYSIS NETWORK (SCAN)



Site/County:
Conrad – Pondera
Violett – Liberty
Fort Assinniboine – Hill
Moccasin – Judith
Jordan – Garfield
Sidney – Richland
Lindsay – Dawson
Table Mountain - Gallatin

For more information on the SCAN project contact:
Chuck Gordon, State Soil Scientist
Email address charles.gordon@mt.usda.gov
Phone 406.587.6818


Ft. Assinniboine SCAN Water Year 2011
Soil Moisture Response Data
24-hr Precip
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response
Daily Precipitation (inches)
Date
44.0
40.0
36.0
32.0
28.0
24.0
20.0
16.0
12.0
8.0
4.0
0.0
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
10/01/10
10/15/10
10/29/10
11/12/10
11/26/10
12/10/10
12/24/10
01/07/11
01/21/11
02/04/11
02/18/11
03/04/11
03/18/11
04/01/11
04/15/11
04/29/11
05/13/11
05/27/11
06/10/11
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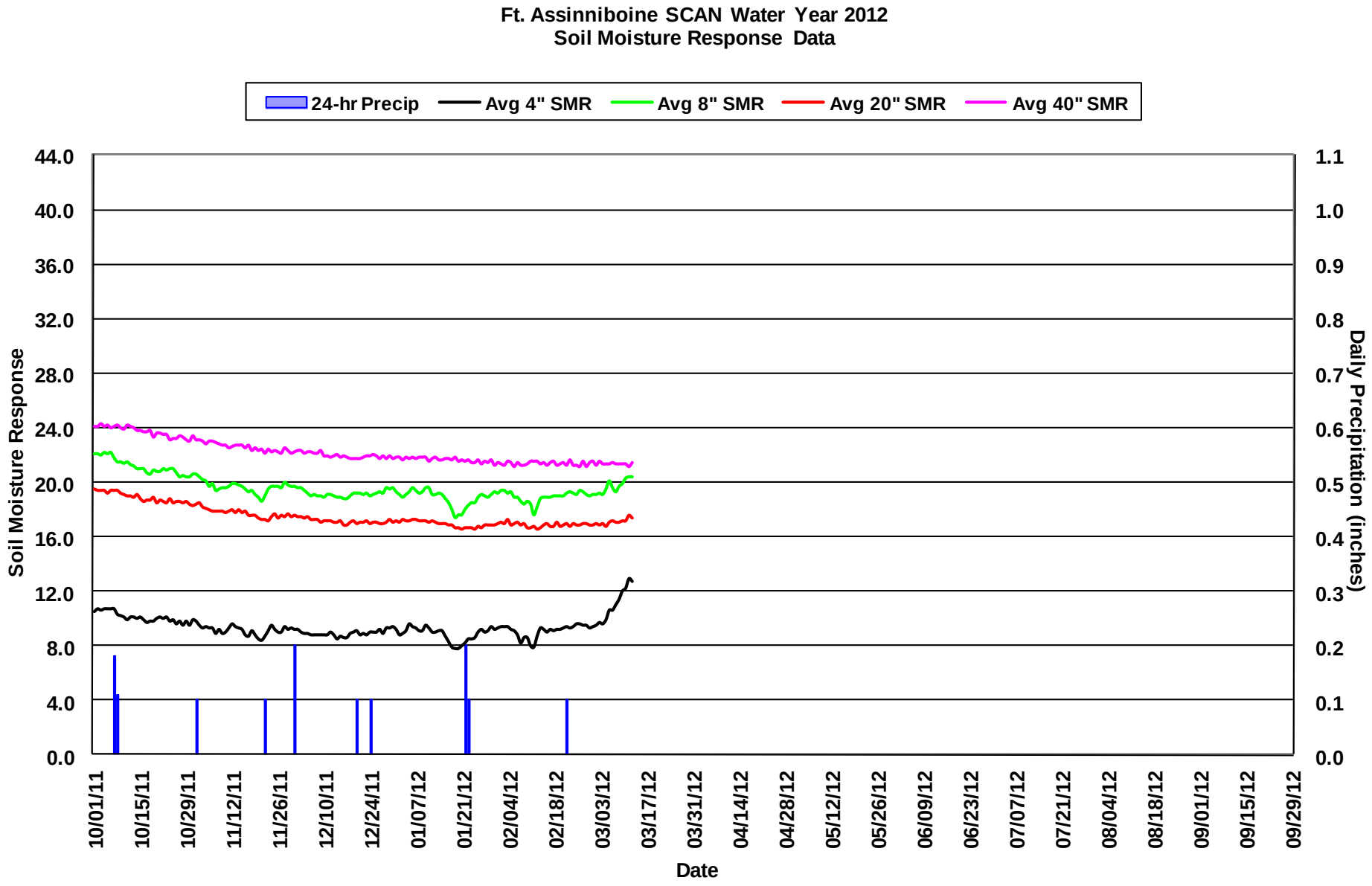
09/02/11
09/16/11
09/30/11


Ft. Assinniboine SCAN Water Year 2012
Soil Moisture Response Data
24-hr Precip
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response
Daily Precipitation (inches)
Date
44.0
40.0
36.0
32.0
28.0
24.0
20.0
16.0
12.0
8.0
4.0
0.0
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
10/01/11
10/15/11
10/29/11
11/12/11
11/26/11
12/10/11
12/24/11
01/07/12
01/21/12
02/04/12
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07/21/12
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08/18/12
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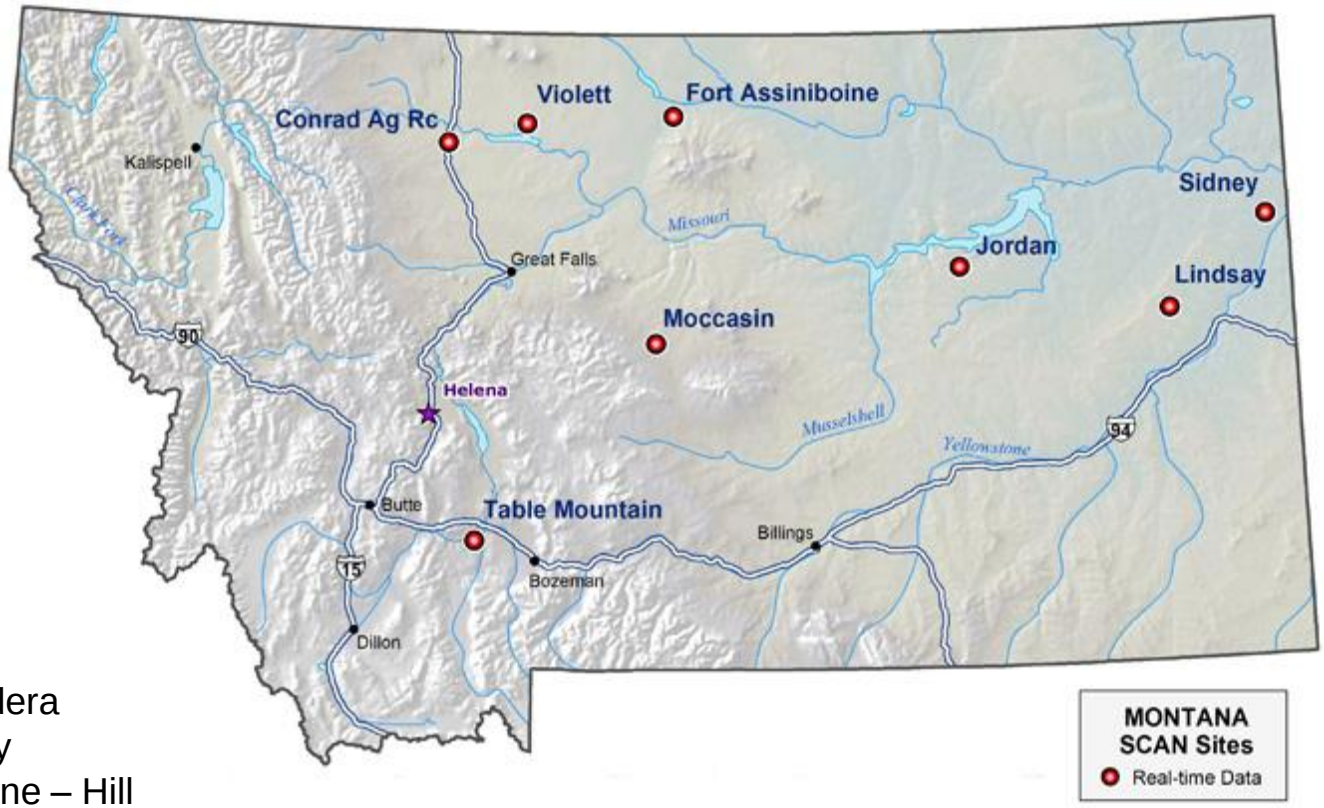
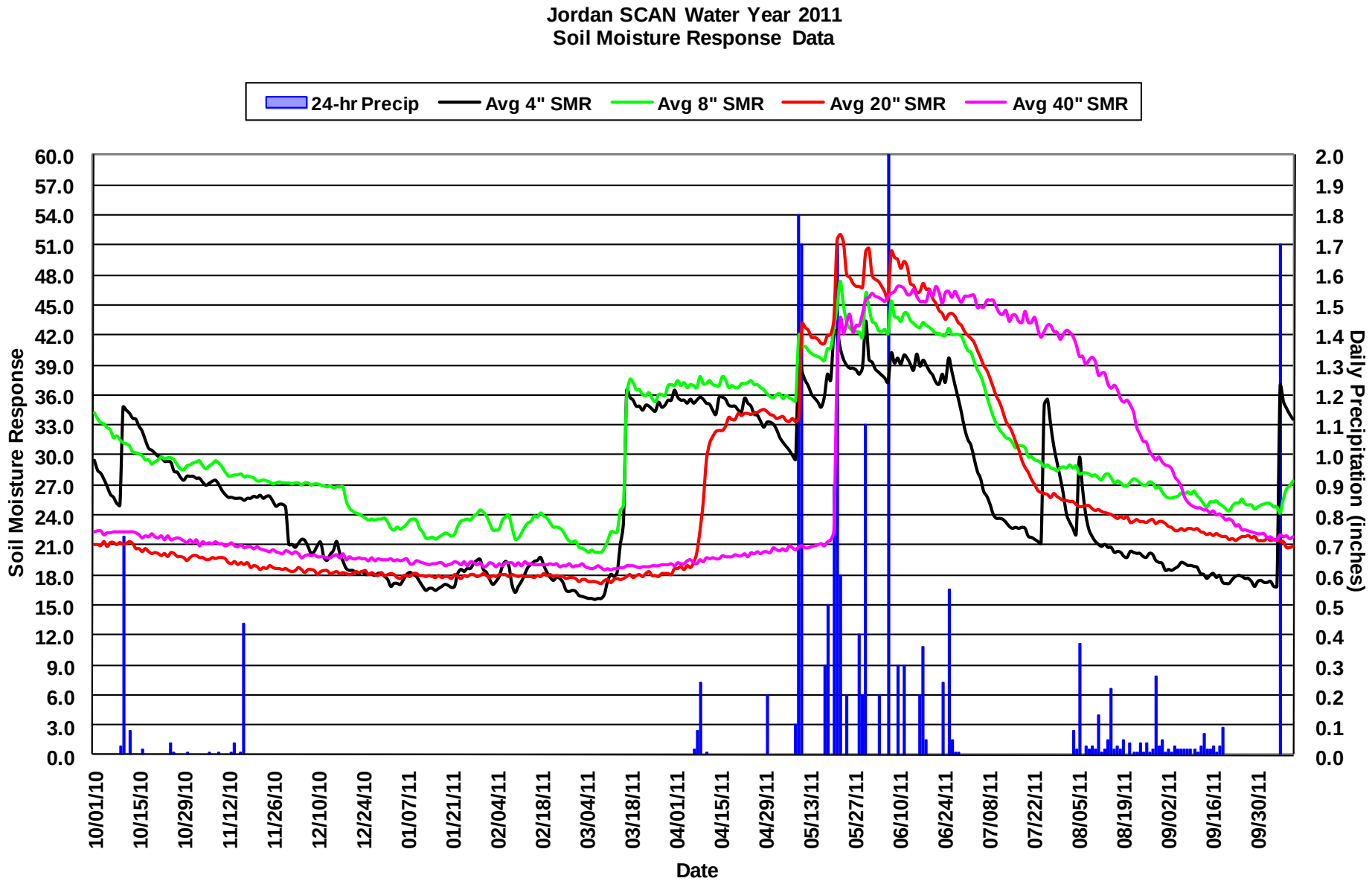
09/15/12
09/29/12

MONTANA SOIL CLIMATE ANALYSIS NETWORK (SCAN)



Site/County:
Conrad – Pondera
Violett – Liberty
Fort Assinniboine – Hill
Moccasin – Judith
Jordan – Garfield
Sidney – Richland
Lindsay – Dawson
Table Mountain - Gallatin

For more information on the SCAN project contact:
Chuck Gordon, State Soil Scientist
Email address charles.gordon@mt.usda.gov
Phone 406.587.6818


Jordan SCAN Water Year 2011
Soil Moisture Response Data
24-hr Precip
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response
Daily Precipitation (inches)
Date
60.0
57.0
54.0
51.0
48.0
45.0
42.0
39.0
36.0
33.0
30.0
27.0
24.0
21.0
18.0
15.0
12.0
9.0
6.0
3.0
0.0
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
10/01/10
10/15/10
10/29/10
11/12/10
11/26/10
12/10/10
12/24/10
01/07/11
01/21/11
02/04/11
02/18/11
03/04/11
03/18/11
04/01/11
04/15/11
04/29/11
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05/27/11
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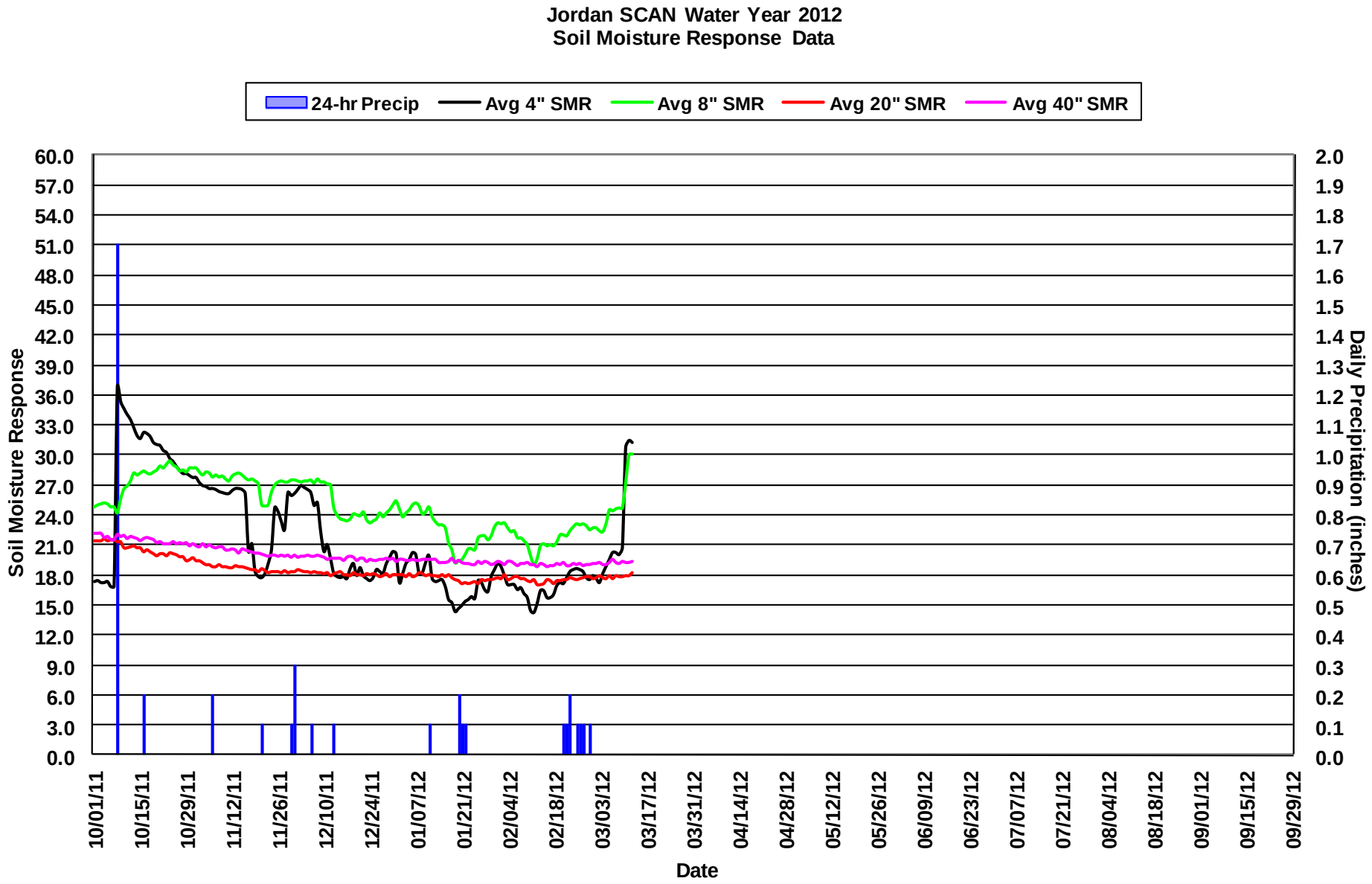
09/02/11
09/16/11
09/30/11


Jordan SCAN Water Year 2012
Soil Moisture Response Data
24-hr Precip
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response
Daily Precipitation (inches)
Date
60.0
57.0
54.0
51.0
48.0
45.0
42.0
39.0
36.0
33.0
30.0
27.0
24.0
21.0
18.0
15.0
12.0
9.0
6.0
3.0
0.0
2.0
1.9
1.8
1.7
1.6
1.5
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
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0.3
0.2
0.1
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10/01/11
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02/04/12
02/18/12
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03/17/12
03/31/12
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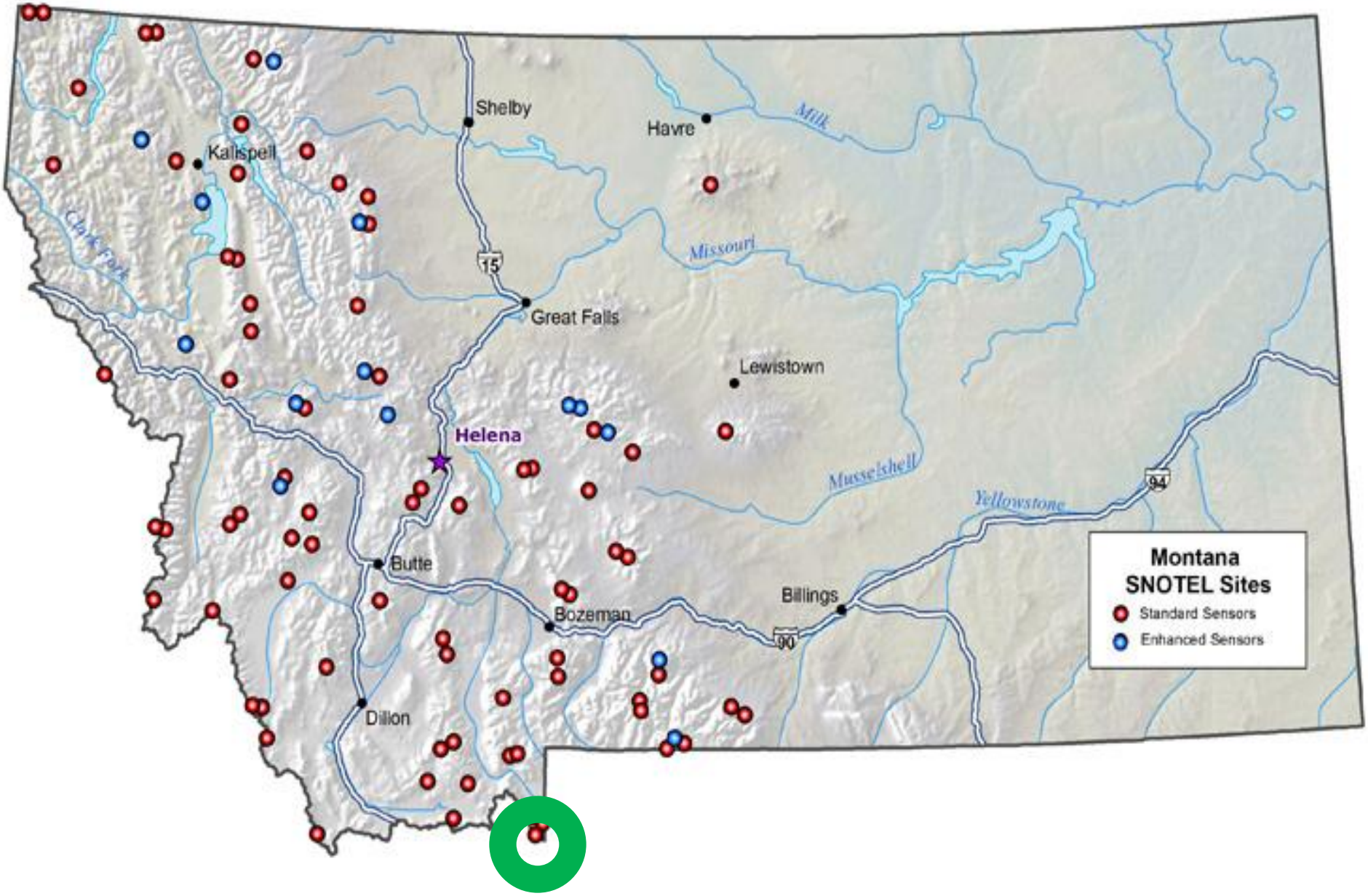
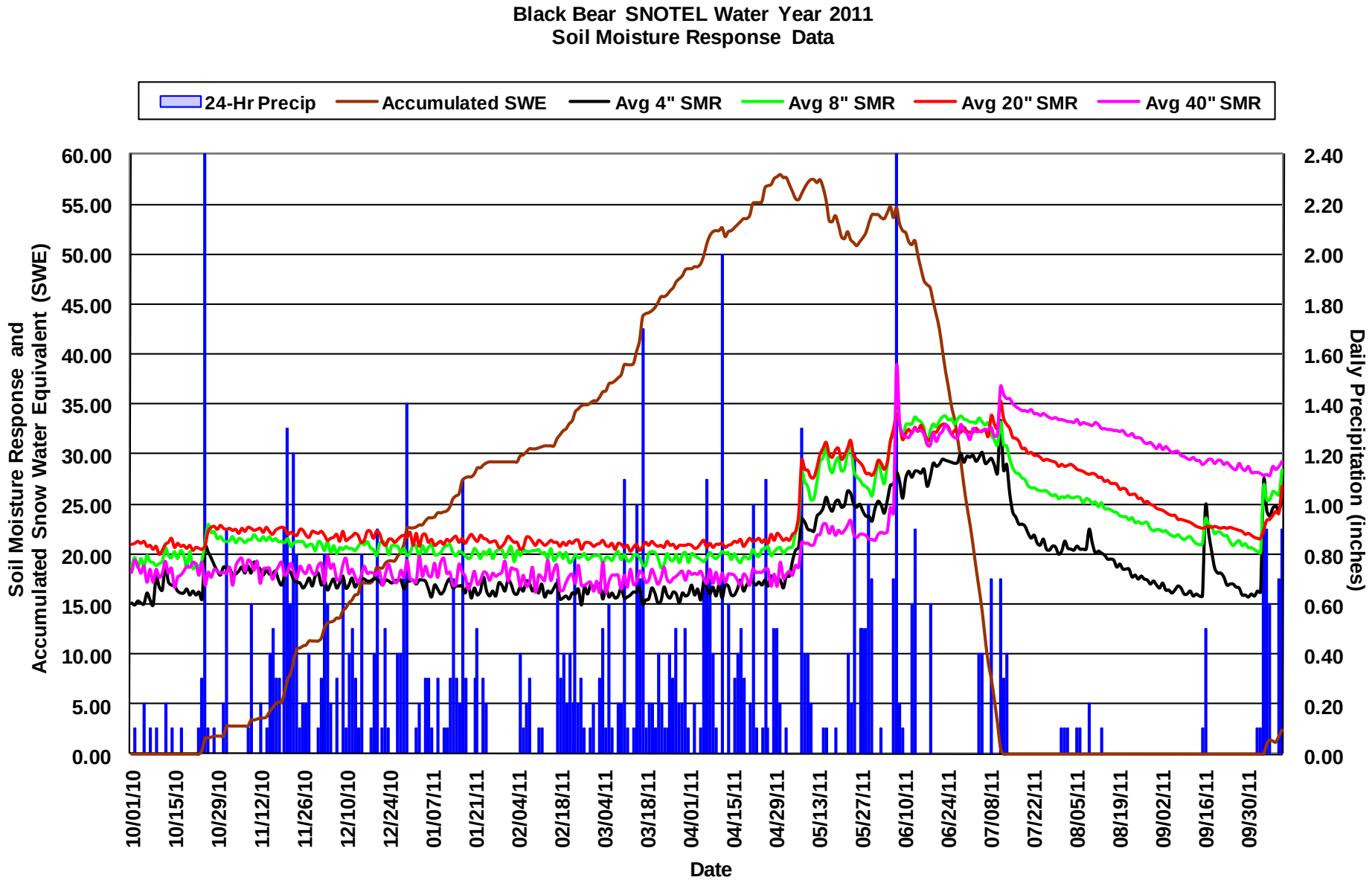
09/29/12


Montana
SNOTEL Sites
Standard Sensors
Enhanced Sensors
Shelby
Havre
Milk
Kalispell
Clark Fork
Missouri
15
Great Falls
Lewistown
Helena
Musselshell
Yellowstone
94
Butte
Billings
Bozeman
90
Dillon


Black Bear SNOTEL Water Year 2011
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
10/01/10
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02/04/11
02/18/11
03/04/11
03/18/11
04/01/11
04/15/11
04/29/11
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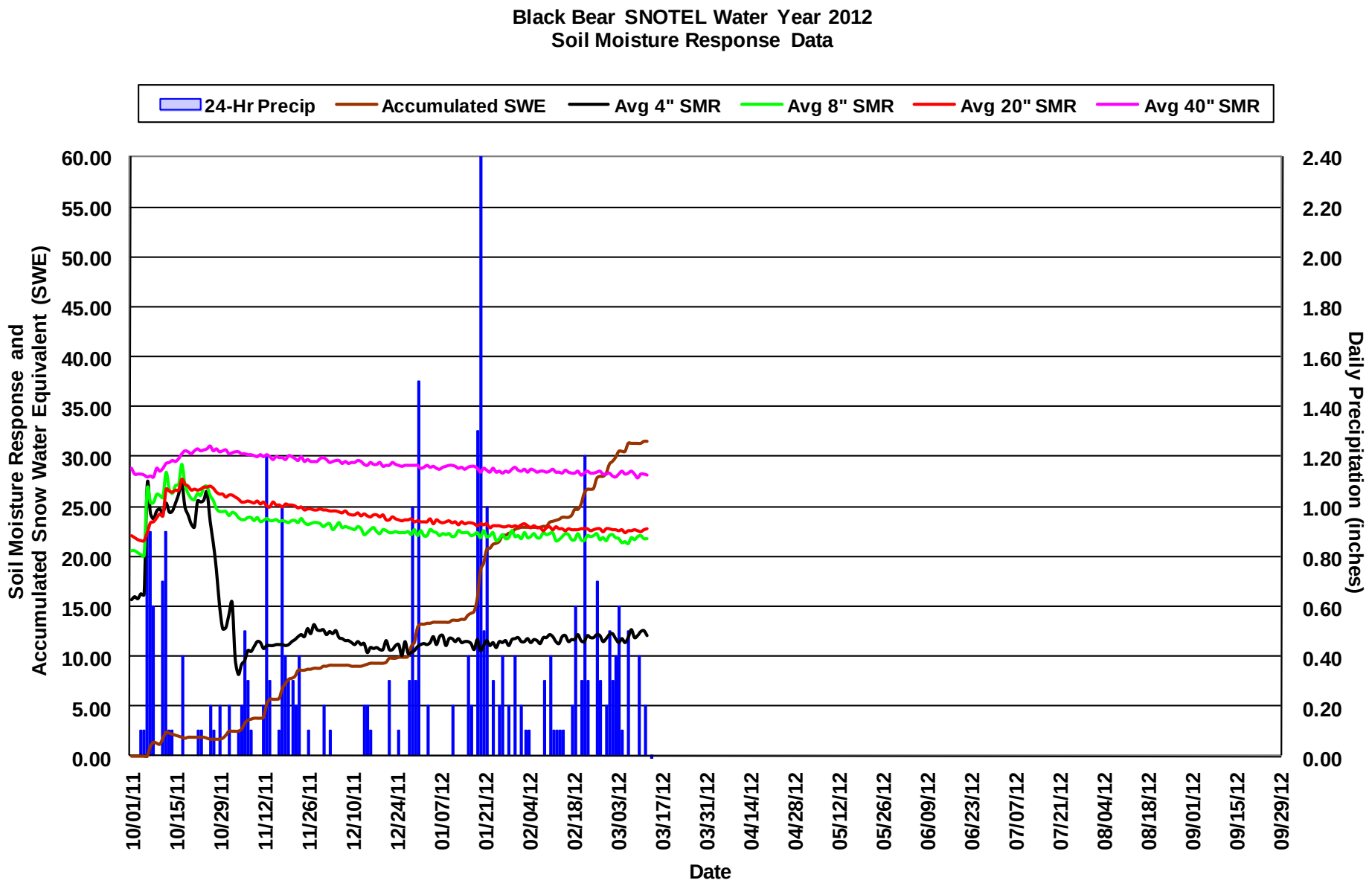
06/10/11
06/24/11
07/08/11
07/22/11
08/05/11
08/19/11
09/02/11
09/16/11
09/30/11
Date


Black Bear SNOTEL Water Year 2012
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
2.40
2.20
2.00
1.80
1.60
1.40
1.20
1.00
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0.60
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10/01/11
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04/28/12
05/12/12
05/26/12
06/09/12
06/23/12
07/07/12
07/21/12
08/04/12
08/18/12
09/01/12
09/15/12
09/29/12
Date

Summary

- Statewide snowpack is average.
- Focusing down to smaller scale basins reveals significant difference among basins snowpack levels.
  - Low snowpack:
    - Bearpaw Mountains
    - Jefferson
  - High snowpack:
    - Lower Yellowstone
    - Kootenai
- Streamflow forecasts statewide are projected to average 96 percent
  - Low: Jefferson - 76%
  - High: Lower Yellowstone - 118%
  - West of the Divide – 97%
  - East of the Divide – 95%
  - Generally streamflows are forecast to be between 85 and 100 % of average
- With 13% of the accumulation season remaining as of today, possibility for change remains, as was the case in 2010 & ‘11
- Soil Moisture on average is slightly below last year but varies somewhat from site to site

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